

JULY 1921 ~ No 186

Monthly

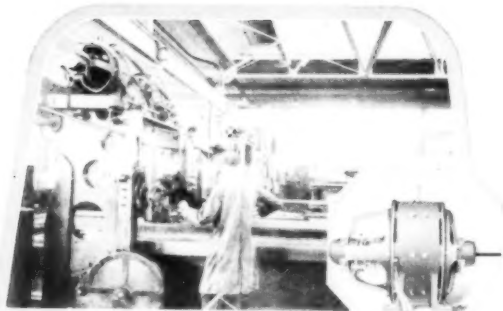
A Reference for Buyers

HITCHCOCK'S
**MACHINE
TOOL LIST**

Distributed Free to Machine Tool
Users Everywhere in the United States and to
Dealers in American Machinery Abroad

Published by
A-H-HITCHCOCK
1220-1235 Caxton Building
Chicago

FOR INDEXES SEE LAST PAGES



Since 1906--250 Reliance Motors

The first Reliance Motor for the company in whose plant this photograph was taken was installed in 1906. Since that time 249 more have been purchased.

Nothing but satisfactory service could result in repeat orders on this scale.

The motor driving this planer is a Reliance Type T—the motor which represents the practical experience of 35 electrical engineers. The story of how this motor was designed and built is told in bulletin 2014.

Reliance Electric & Engineering Co.

1050 Ivanhoe Road, Cleveland, Ohio

Branches:

Boston New York Philadelphia Pittsburgh Cincinnati Detroit Chicago

*We specialize in motors, sizes 1/2 to 150 h. p. constant and adjustable speed
D. C., squirrel cage and slip ring A. C.*

Type

Heavy Duty
RELIANCE MOTORS,
Direct Current





The New GRIDLEY

Following are some of the new features of the 9/16" Gridley Multiple Spindle Automatic—principles that mean lower costs to makers of screw products.

1. New Spindle Bearings—closer running fits, extreme accuracy at high spindle speeds, with longer life of spindles and bearings.
2. Swinging Stock Stop—permitting the use of extra tools in the fourth spindle position when required.
3. Pusher Return Ring—guides pushers uniformly and provides for longer feeding out without the use of special equipment.
4. Improved Finger Holders, and Chuck Operating Spools—less friction and more positive action of collets.
5. Draw Back Collets—easier stock feeding, greater resistance to end thrusts—no strain on stock stop and less overhang in spindles.

These brief points and others are described in a bulletin "G-B." Then get the actual figures on your work—check up with Gridleys.

THE NATIONAL ACME COMPANY WINDSOR, VERMONT

General Offices, Cleveland, O.

Canadian Screw Plant, Montreal, P. Q.

Branch Offices:

New York

Boston

Chicago

Detroit

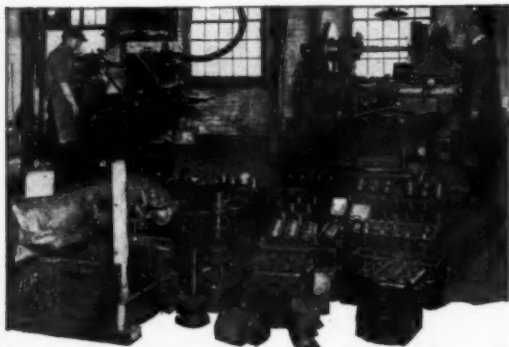
Buffalo

Warehouses—New York, Chicago

With Foreign Representatives

Makers of Gridley Single and Multiple-Spindle Automatics at Windsor, Vt., and Acme Automatics, Threading Dies, Collapsing Taps and Screw Machine Products at Cleveland, Ohio

Cylinder Grinding for Machine Shops, Auto Repair Shops, and Welding Companies



Cylinder Grinding Corner at Ramdell & Van Dyke's, Worcester, Mass.

Possibilities

There were 8,000,000 registered cars last year and only approximately 500 concerns properly equipped to grind.

Profits

3 four-embloc cylinders a day will give a two-man shop unusually attractive profits on capital invested.

Grinding Machine

The Heald Style No. 55 is self-contained, simple, has a large range and can be bought at a nominal price.

We would like to give you full details on the possibilities, profits and advantages of cylinder regrinding

The Heald Machine Co., 6 New Bond St., Worcester, Mass.



DELIVERY

Speeding up production is a matter of equipment. Check your cutter equipment by catalog 28 and make it complete with

**Brown & Sharpe
Milling Cutters**

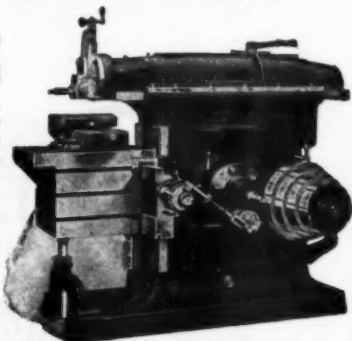
We are offering prompt deliveries.

**BROWN & SHARPE
MFG. CO.
PROVIDENCE, R. I.**

SHAPERS

12", 14", 16"
Plain Crank,
16", 20", 25"
B. G. Crank,
either Cone
Driven or
through
Speed Box.

28" and 32"
Back Gear-
ed Crank,
Single Pul-
ley Drive.



The Smith & Mills Co. Station B.,
Cincinnati, O., U.S.A.

Shapers

The best medium
priced Shaper on
the market.

Built in 16", 20",
and 24" sizes, all
back geared crank
machines.

V-type ram.
Double face bull
gear.

Ask us about them



The Osborne & Sexton Mchy. Co.
Columbus, Ohio

OVER 50,000 MILES
NOW REPORTED ON

“WHITNEY”

High Efficiency

FRONT END
MOTOR CHAIN DRIVES

AND STILL IN GOOD CONDITION



Not one of these
chains has been
known to skip a
sprocket tooth.

Chains having a
high mileage save
inconvenience
and frequent re-
placement ex-
pense.



The Whitney Mfg. Co.
HARTFORD, CONN.

COLUMBIA SHAPERS

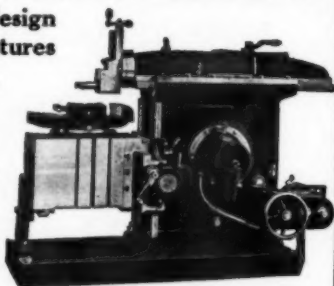
Correct design
Latest features

Highest grade
construction.

A strictly
Quality
Proposition.

Compare the
machines.

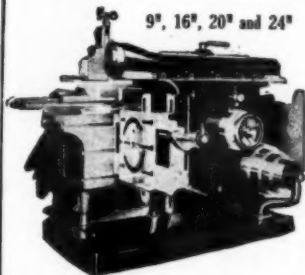
Buy a MODERN
Shaper



16", 20", 24", 28", 32"

The Columbia Machine Tool Company
Hamilton, Ohio

The "MILWAUKEE" Offers 100% Shaper Service



9", 16", 20" and 24"

The positive stroke control is instantly adjustable. The Friction Locking Device, positive in action, stands up under the *heaviest* strains. Swivel tables can be swung to any angle. Rugged ram with "V" ribs operates without vibration. Powerful back gearing. Rigid column.

Want particulars?

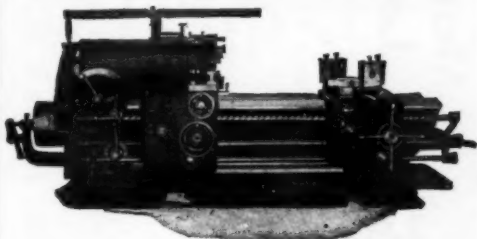
MILWAUKEE SHAPER CO.,

Milwaukee, Wis.

STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



The Tool and Its Product

The tool invariably bears a direct relationship to its product. A good tool, well designed, and of proper construction means accurate work at very low production cost. There are many money-saving features about the STEINLE TURRET LATHE that instantly appeal to the careful buyer. The general massive construction, the ease of operation of all parts, the single pulley drive and 30 reversible spindle speeds, the power rapid traverse of both carriages, the power cross feed of side carriage and the general adaptability to special tooling, enabling rapid, accurate, and economical production—these are strong points well worth considering.

STEINLE LATHES are widely used by leading concerns. They can produce for you as they are now producing for others.

Why not send us your blue prints and let our Engineering Department determine what can be done on your own work?

Monarch Lathes

give universal satisfaction to the user. They have been doing this for years, and this accounts for the ever increasing demand for **Monarch Lathes.** Built in all styles and with any attachments desired.

Sizes 10 to 30-inch Swing

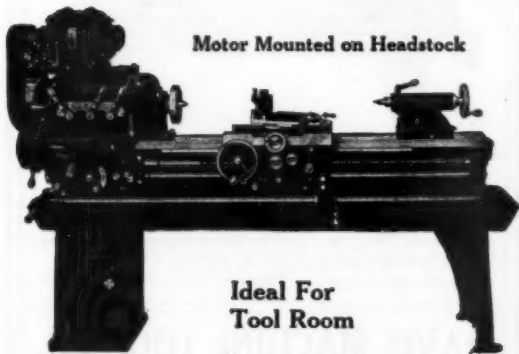
*Sold by a leading Machinery Dealer
in every machinery center.*



THE MONARCH MACHINE TOOL CO., 106 Oak St., SIDNEY, OHIO

New Willard ^{Mattman Bratten} Improved Lathe

D. B. G., Q. C., All-Geared-Head
13" High Power. Also Made 15" Swing



The NEW WILLARD, fully redesigned, leaves nothing to be desired as to precision and rigidity, enabling your men to do the widest variety of work with maximum speed and economy.

The headstock is a full box section, rugged and self-contained. All speed changes are selective and are made within the headstock. Only one speed can be engaged at one time. All gears are chrome nickel steel and all sliding gears are hardened. Chrome nickel steel spindle is forged and bored from the solid and guaranteed interchangeable.

Six different speeds are available, and six more thru back gears—TWELVE IN ALL. Rigidly accurate bed, with chilled V's and flats, throws practically all wear on the carriage. Top slide of compound rest is a steel casting, and is taper gibbed. Motor drive—D. C. or A. C. SKF bearings thruout headstock and pulley.

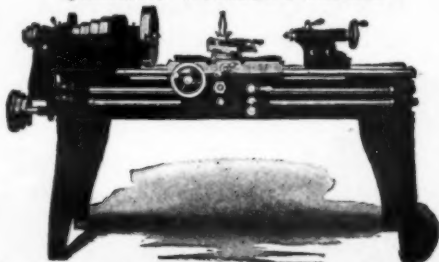
*We build WILLARD LATHES in ALL STYLES,
and shall be glad to mail you full description*

The Willard Machine Tool Co., Inc.
F Street, Box 784 - CINCINNATI, O., U. S. A.

"STANDARD" ENGINE LATHES

14"-16"-18"-20" swing. Beds 6 to 16 ft.

"QUALITY WITHOUT FRILLS"



A moderate price lathe combining simplicity and accuracy with the highest grade of materials and workmanship. Suitable for repair shops, garages, manufacturing plants, etc. *Send for descriptive circular and prices.*

THE STANDARD LATHE WORKS

2951-61 Colerain Ave., CINCINNATI, OHIO, U. S. A.

DAVIS MACHINE TOOL CO.

ROCHESTER, - - NEW YORK

MANUFACTURERS OF—

14—16" Close Coupled Tool Room Lathes.

12—14—16" Engine Lathes.

24"—Chucking Lathes.

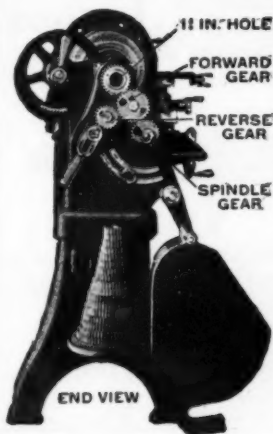
14—16—20—24" Shapers.

3—4½—6" Cutting-off Machines.

No. 1—2 Keyseaters.

20" Drill.

Complete information upon request



Barnes 18 inch Lathe

Bronze Boxes

Steel Racks

Hole in Spindle
1 5/8" Diameter

**For Garage, Repair Shop and
Manufacturing Purpose**

6 ft. Bed \$625.00
8 ft. Bed \$650.00
10 ft. Bed \$675.00

Lathes of 9 to 18 inch Swing

Made By

W. F. and John Barnes Co.
123 Ruby St., Rockford, Ill.

Sidney Medium and Heavy Duty **Lathes**

Include Lathes for every class of work
In shops of any size or type



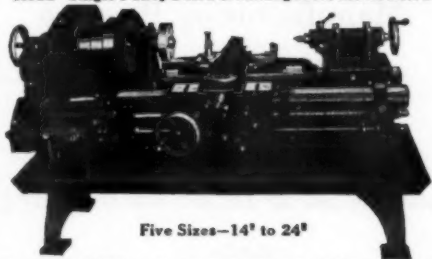
MEDIUM DUTY LATHES in 14", 16", 18" and 20" swing.
HEAVY DUTY LATHES in 15", 17", 19", 25", 27",
30" and 36" swing. They give satisfaction everywhere.

Write for Bulletin No. 45

The Sidney Machine Tool Co.
Sidney, Ohio

"LEHMANN LATHES"

Three Step Cone—Double Back Geared and Geared
Head—Single Pulley Drive or Arranged for Motor Drive



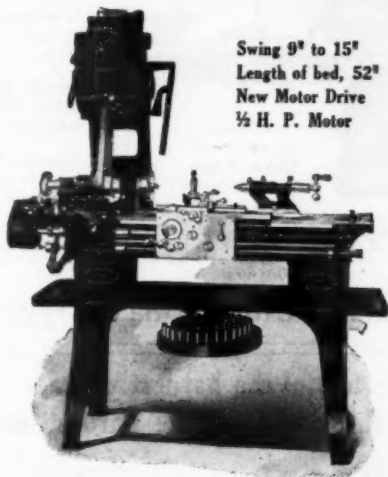
Five Sizes—14" to 24"

These are strictly high-grade engine lathes of superior design and thoroughly good workmanship and material. Built for accuracy and production.

Write for complete specifications and details. Do it today—NOW.

LEHMANN MACHINE CO., 3562 Chouteau Ave., ST. LOUIS, U.S.A.

Hardinge Quick Change Swing Cataract Precision Lathe



Swing 9" to 15"
Length of bed, 52"
New Motor Drive
½ H. P. Motor

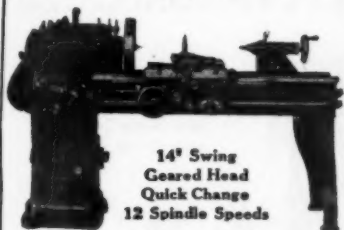
**Great Precision.
Exceptional Range.
Ease of Manipulation.**

The above three qualities are exemplified in this splendid lathe to such an unusual degree that it stands practically alone in the combination of variety, quantity and quality of output—particularly true on small, difficult work involving a variety of operations. Cuts double, triple or quadruple screw threads. Turret, milling and bench lathe fixtures may be used by simply changing draw bolts. Compound slide with all latest attachments and adjustments.

Write for Catalog, which is profusely illustrated, with specifications and thread cutting and metric gear tables

HARDINGE BROTHERS, Inc., Chicago, Ill.

"Economy" Motor Driven 14" Lathe



**14" Swing
Geared Head
Quick Change
12 Spindle Speeds**

No vibration.

**32 changes of
threads and
feeds.**

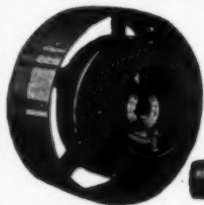
**Bronze bear-
ings, sight
feed oilers.**

**Accurate and
highly pro-
ductive.**

A small heavy duty lathe, splendidly designed and carefully built of the best materials. It has the weight and power for rapid production and the extreme accuracy essential for tool room purposes. *Write for circular.*

**Rockford Lathe & Drill Co., Rockford,
Illinois**

The test of the hardest usage by those who are the hardest users



Enclosed Type, Self-Oiling

A friction clutch that has stood the test for many years on all kinds of machine tools surely is some clutch. You can put a clutch of that kind up against any proposition with perfect confidence.

The Edgemont Friction Clutch

has been used for years by the leading machine tool builders (names on request) with perfect satisfaction. If there was any better clutch they would have it.

Write for Catalog of "The Clutch that's stood the test"

**The Edgemont Machine Co.
Dayton, Ohio**

Special Clutches and Transmission Machinery for all purposes.

Pedrick Lathe Boring Bars



There are many times when you could profitably use one of your lathes for boring—if you only had the proper appliances at hand.

We can equip you for such work with one of our Lathe Boring Bars. They are made in diameters from 2½" to 6" and various lengths, with a large assortment of cutterheads to meet miscellaneous requirements.

The lathe provides the power, and each bar has a two-change constant feed, hand-controlled or automatic. The bar is rigidly held and is easily taken down and reset without changing the alignment.

Put your boring problems up to us. We have all kinds of new boring machines, from our Standard Portable Cylinder Boring Bar to our new Floor Boring Machines.

Pedrick Tool & Machine Co.

3644 N. Lawrence St., Philadelphia, Pa.

**Builders of Portable Cylinder Boring Bars, Crank Pin Turners,
Portable Millers, Pipe Benders, etc.**

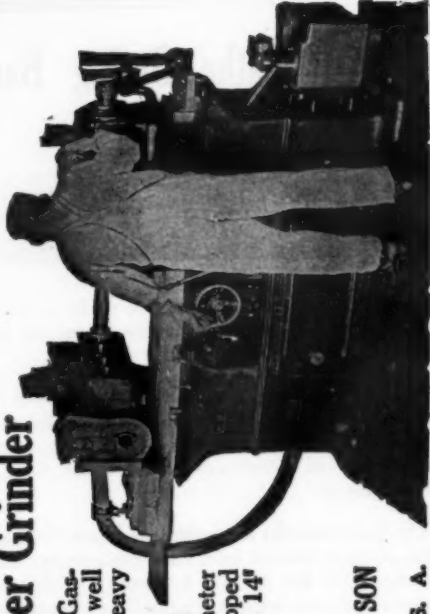
Whitney Cylinder Grinder

For grinding all kinds of Gasoline Engine Cylinders as well as work too large or too heavy to revolve.

Machines furnished to grind holes from 3" up to 7" diameter and 14" deep. Also equipped to grind holes as large as 14" diameter and 20" deep.

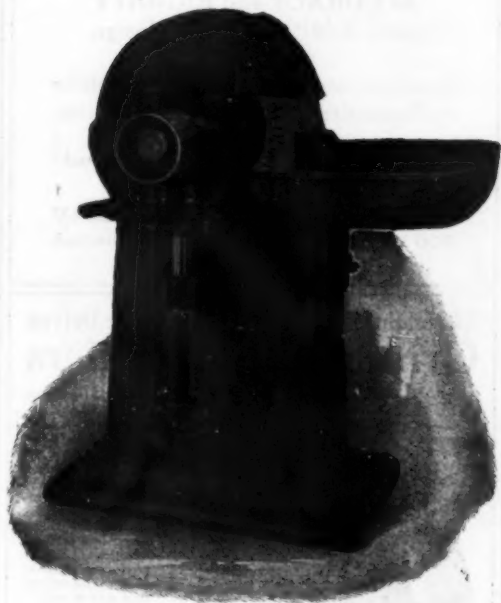
Write for new catalog

BAXTER D. WHITNEY & SON
Incorporated
WINCHENDON, MASS., U. S. A.



GRIND IT On a BLOUNT

20" Wet Tool Grinder



Catalog on request

Blount Wet Tool Grinders are built in three sizes for 14", 20" and 30" Grinding Wheels respectively.

J. G. BLOUNT CO., Everett 49, Mass.

Ott Grinders

Combine the essentials of
ACCURACY and **RIGIDITY**
with **SIMPLICITY** of design

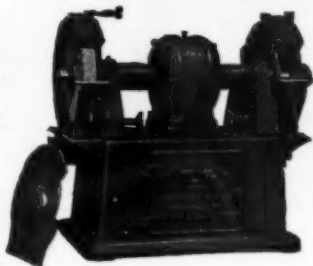
Simplicity accounts for their price, and for
their popularity among good operators.

5"x18" Plain—10"x32" Universal—6"x6" Internal

Ott Grinder Company

200 West Tenth St., Indianapolis, Ind.

"Economy" A. C. and D. C. Motor Driven Grinders and Buffers



The picture shows
our 18" heavy du-
ty grinder; also
made in 20" size.

Entirely self-con-
tained, and built to
practically elim-
inate vibration.
SKF ball bearings.
Complete exhaust
system. Highly
productive, wonder-
fully convenient,
and safe to use.

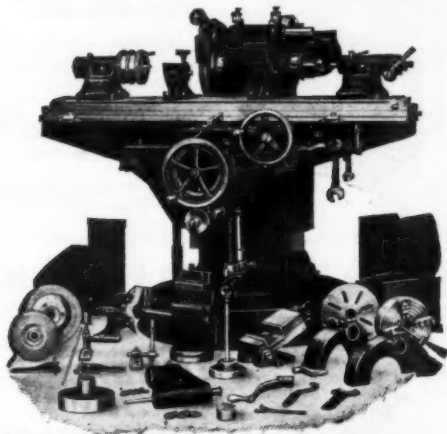
"Economy" Grind-
ers in other sizes.

Write for description and state your grinding needs

Marschke Mfg. Co., Inc., Indianapolis,
Indiana

Whenever necessary—

The Thompson Universal immediately becomes a rapid and accurate surface, edge, die, cutter or internal grinder



ITS ECONOMY and convenience is obvious even to the new apprentice in your shop. It easily takes care of any operation that may come up in a modern machine shop. An exclusive feature is the maintaining of the grinding wheel in a fixed position, while the table carrying the work is adjustable to any desired position relative to the wheel. In precision, capacity and universality it leaves nothing to be desired. Let us mail you the specifications, or see one of

OUR SELLING REPRESENTATIVES:—

Notch & Merryweather Mch. Co.,
Cleveland, Ohio
Manning, Maxwell & Moore, Inc.
New York, Philadelphia, Pittsburgh,
Buffalo, Cincinnati,
St. Louis, Seattle
Boston, Mass.
Hill, Clarke & Co.,
Kemp Machinery Co.,
Baltimore, Md.

Riverside Machinery Depot, Detroit, Mich.
Coghlin-Kirkby Mch. & Sup. Co., Toledo, O.
Wayne Mch. Co.,
Ft. Wayne, Ind.
Dayton, Ohio
Chicago, Ill.
Hill, Clarke & Co.,
F. E. Satterlee Co., Minneapolis, Minn.
F. O. Stallman Supply Co., San Francisco,
Los Angeles, Calif.

FOREIGN:

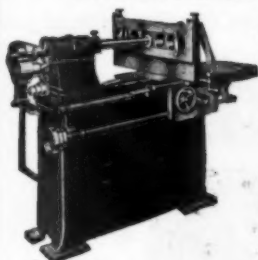
Evans & Edwards Pty., Ltd.,
Melbourne, Sydney

Selson Engineering Co., London, Belgium,
France, Italy

THE THOMPSON GRINDER CO., Springfield, Ohio

"Schmidt" Internal Grinder

For More and Better Work



Will grind six Ford blocks in a day—larger cylinders in proportion.

Will take care of all makes and sizes of cylinders and cylinder blocks.

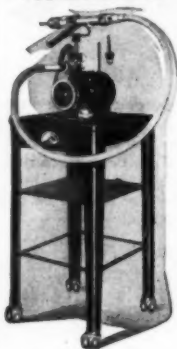
Indispensable for the fully equipped automobile and tractor repair shop.

Built for tough wear and tear. Floor space, 3'x5'.

Prompt Delivery. Write for full particulars.

B. L. Schmidt Co., Dept. A 8, Davenport, Ia.

Types ML 5-6



We build them

Strand

TRADE MARK

**FLEXIBLE SHAFT
EQUIPMENT**

For

Lathe or Shaper

This type machine is arranged for grinding or polishing in the lathe or shaper, precision work accomplished thru its use. Several other types for various jobs.

**N. A. Strand & Co.
Machinery Hall, CHICAGO**



DUMORE No. 1 **GRINDER**

Machine Tool Builders Use **DUMORE HIGH SPEED GRINDERS**

THE Wood Turret Machine Company of Brazil, Indiana, uses the DUMORE High Speed Grinder in many ways which readily show its real merit—in grinding the head of the Wood Turret Lathes for example, and in finishing spindle ends, etc.—the high speed of the DUMORE giving a result much superior to that obtained from slow speed grinders.

Here is a tool in which perfect running balance is combined with correct cutting speed. With a DUMORE in the shop there is no costly tearing down of jobs—no wasteful delay. It is set up easily and quickly wherever it is needed. The DUMORE can solve your grinding problems. It is the only tool on which you may surely rely for speed and accuracy.

Your dealer sells DUMORE Grinders
Ask him for a demonstration

WISCONSIN ELECTRIC COMPANY
4337 Sixteenth Street RACINE, WISCONSIN

DO You Use AIR?

THE POWELL AIR GUN VALVE

"JUST PRESS"
THE BUTTON



BUY
POWELL
AIR GUNS
KEEP
CLEAN

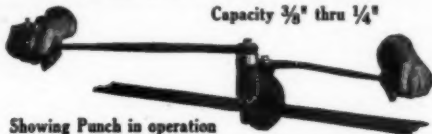
CLEANS
WORK BENCHES
AND
MACHINE TOOLS
MADE IN SIZES
 $\frac{1}{8}$ " TO 1"

ORDER A SAMPLE
THE W. M. POWELL CO.
1200 DRAPER ST.
CINCINNATI, O.

Whitney ^{Ball} Bearing Punch No. 10

Lightest, fastest, easiest working tool made
for punching sheet metal, angles, etc.

Capacity $\frac{3}{8}$ " thru $\frac{1}{4}$ "



Showing Punch in operation

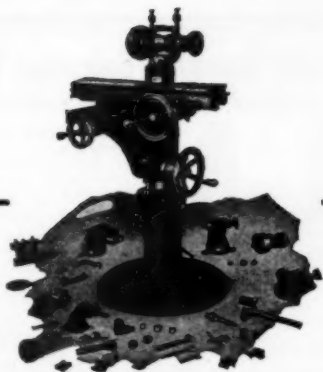
With the elimination of friction, all the energy applied to the levers is transmitted to the punch. This permits a thread pitch impossible on any other punch, placing this tool *in a class by itself*. The spindle and drop-forged frame are made of special steels and heat treated. All parts made to jigs and interchangeable.

Write for description and our punch price list

Whitney Metal Tool Co.

109-111 Forbes Street,

Rockford, Ill.



Greenfield
TRADE MARK REG. U. S. PAT. OFFICE

No. 2 Universal

A VERSATILE GRINDER. Head swivels on Standard. Standard swivels on Base. Slides turn *with* Standard, not around it.

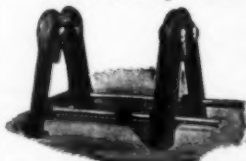
A substantial, well built grinder equipped with a large assortment of convenient attachments designed for handling a wide variety of work.

Ask for particulars

Greenfield Machine Company
Greenfield, Mass., U. S. A.

Anderson Improved Balancing Ways

Ever-Ready—Sensitive—Reliable



They need no adjusting. The rotating discs made of chilled iron run in specially designed ball bearings and are exceptionally sensitive.

Made in various sizes for balancing pulleys, gin brushes, turbine rotors, crank shafts, polishing wheels, fly wheels, etc.

"Swing"	20"	40"	60"	72"	96"
Greatest distance between standards.....	20"	30"	30"	66"	88"
Capacity in lbs.	1000	2000	2000	5000	10000
Approx. shipping weight.....	45	90	150	350	650
Code.....	20d	40d	60d	72d	96d

Full details on request

Anderson Bros. Mfg. Co.
1915 Kishwaukee St., Rockford, Ill.



Blind Men

Can't Turn Accurate Tapers

Yet every man you employ for that purpose is partially blind unless he can see easily and quickly whether he has really secured the desired accuracy or not.

The Hartford Taper Gage

supplies the required extra sight. It enables the eye to detect the slightest inaccuracy and to see when the taper is right. It is simple and very inexpensive for the time it saves and the accuracy it insures.

Drop us a line for the details

Hartford Special Machinery Co.
285 Homestead Ave., Hartford, Conn.

DETROIT CENTERLESS CYLINDRICAL GRINDERS

For grinding straight cylindrical work without the use of centers



Grinds in rows *continuously*, greatly increasing production.

Feeds *straight* thru guide blocks, and pieces rotate slowly, insuring work that is *round and perfect*. Grinding surface of wheel over 200 square inches.

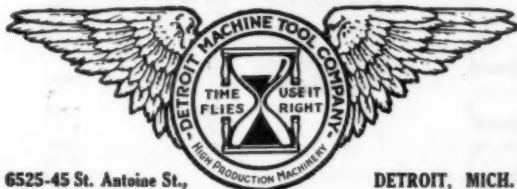
Capacity, $\frac{3}{4}$ " (and smaller) to $1\frac{1}{4}$ " diameter, in various lengths.

Figure out your production

The complete Production Table, shown in our literature, enables you to figure production time on all diameters. The following sample figures show four diameters only:

Diameter	Length	Ft. of Pins per hour	Pos. per hour
$1\frac{1}{4}$ 1.250-1.249.....	4	20	60
1 1.000-0.999.....	$3\frac{3}{4}$	22	70
$\frac{3}{4}$ 0.750-0.749.....	$3\frac{1}{2}$	24	82
$\frac{1}{2}$ 0.500-0.499.....	2	28	168

Let us grind 25 samples free; and write for description



6525-45 St. Antoine St.,

DETROIT, MICH.

CULLMAN SPROCKETS

STOCK AND TO ORDER



Diamond, Whitney, Baldwin, Duckworth and
Coventry Chains, Block, Roller and
High Speed Silent types on hand

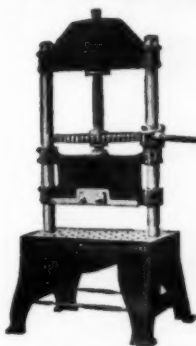


CATALOG

CULLMAN WHEEL CO.,
1359 ALTGELD STREET

CHICAGO

Two Unusual Machines



Type B Screw Press

The "Manhattan" Press costs a tenth of the price of a punch press. For quick and accurate aligning of punches and dies it puts it all over the punch press. It affords perfect alignment. It allows a complete view of punch and die from all sides. Avoids holding up punch presses for this work, and cuts out the extra labor costs required to operate them.

The "MANHATTAN" is a one-man machine. Combines maximum efficiency with economy.



Manhattan Surface Grinder

It is compact, massive and rigid. Has oversize phosphor bronze bearings. Even under the heaviest work there is no chatter. Fractions of 1000's of an inch may be obtained on both feeds. Shape of body casting affords maximum clearance. Its special features and improvements greatly increase its accuracy and productivity.

High grade machinery steel spindle runs in large dust-proof, wick-oiled bearings.

IT IS NOISELESS

*Let us send you full particulars about
these quality machines*

Manhattan Machine & Tool Works
Dept. A, Grand Rapids, Mich.

We are prepared to estimate on
Building Special Machines

from submitted plans and specifications—making special tools.
We have the experience, men
and “know how.”

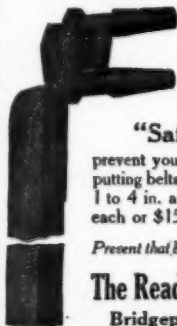
Let us have your inquiries

A. F. WAY CO., Inc.

P. O. Box 1088,

HARTFORD, CONN.

Prevent Injury to Your Men
By Using “Safety First” Belt Sticks



It is now the “stick” in time that saves nine—accidents. Made with three rollers, two of them tapered, there's no chance whatever for the hook to get caught.

“Safety First” Belt Sticks

prevent your men—or women—getting hurt while putting belts on moving pulleys. Made in two sizes, 1 to 4 in. and 4 to 6 in., at one price, only \$1.50 each or \$15 a dozen.

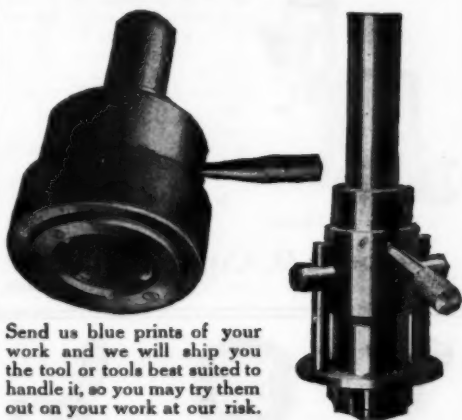
Present that bad accident by ordering a few “Sticks” today

The Ready Tool Co.
Bridgeport, Conn.



Murchey Tools

Shipped on Approval



Send us blue prints of your work and we will ship you the tool or tools best suited to handle it, so you may try them out on your work at our risk.

Compared with solid tools, they save 50 to 75 per cent in time, give longer service, and do away with the risk of stripping threads. Made in two types for horizontal and vertical machines. They ream, face and thread without stopping to change tools. Their record for service and economy is unsurpassed.

We'll appreciate your trial order—you'll like our tools

Murchey Machine & Tool Co.

850 Porter Street, Detroit, Mich.

NEW YORK OFFICE	99 Warren Street
CLEVELAND OFFICE	1625 Williamson Bldg.
PITTSBURGH Representatives,	Laughlin & Barney, 483 Union Arcade
CHICAGO Representatives,	R. E. Ellis Engineering Co., 621 Washington Blvd.
LOS ANGELES Representatives,	Harron, Rickard & McCone, 225 So. San Pedro St.
Coats Machine Tool Company, 14 Palmer St., Westminster, London, S.W., England	
Fenwick Freres & Company,	8 Rue de Rocroy, Paris

You Advance the Price

In a few months' time the Curtis
will have returned its cost to you



No. 400—Capacity: 2 Bushels

It is pure economy to buy a Curtis. Extracting the oil from your chips and shavings will save many barrels in the course of a year, and reduce your oil bills to that extent. It is a sturdy, ball-bearing machine that requires but little attention or power. Three sizes.

Be up-to-date in all your departments. Send for details of this economizer today.

Albert B. Curtis Estate

Box 44

--

--

Worcester, Mass.



Style "C"



The Hinge



Style "Y"



Style "B"



Style "G"



Style "O"



Style "L"



Style "T"

GITS OIL CUPS

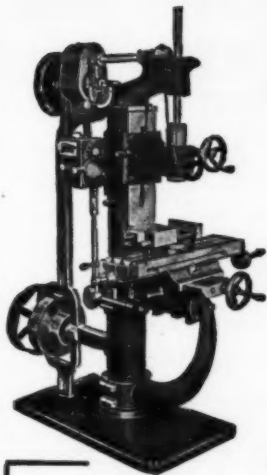
Give perfect satisfaction where others fail. State style and size in which you are interested, and we will send free samples and catalog.

GITS BROS. MFG. CO

1940 SO. KILBOURN AVE., CHICAGO



Style "H"



**"they sure
do help
to reduce
costs in the
tool room"**

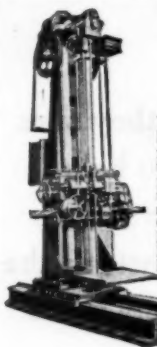
That is the testimony—

from shops in all parts of the U. S. A. regarding the efficient Knight Milling and Drilling Machines. The four sizes never fail to save time on the most intricate problems, including all kinds of die, tool and jig work. They mill, drill and bore at any angle with just one setting of the work.

They mill die blocks and beveled ways; center shafts; are used as a drill guide; mill out metal core boxes and oval depressions in die plates; make forming tools; do slotting work and many other jobs that will suggest themselves to alert mechanics.

*As cost reducers they are top-notchers
Write for illustrated circular*

W. B. Knight Machinery Co.
3920 W. Pine St., St. Louis, Mo.



For Irregular Shaped Large Castings

With P & H Horizontal Drilling and Boring Machines you can drill 4, 6, 8 inches horizontally; you can drill and face; you can drill and back-face; drill and bore on long and bulky sections; you can save money and do some classes of work in ways you will find far in advance of average methods. Used all over the country—Crane Co., Bucyrus, Hanna Engineering, Goodman Mfg. Co., Worthington, Nordberg, Ingersoll Milling, Illinois Steel, Obenberger Forge, Elms, Falk, Allis-Chalmers, etc., etc.

Bulletin 214 on request.

MACHINE TOOL DIVISION

Pawling & Harnischfeger Company

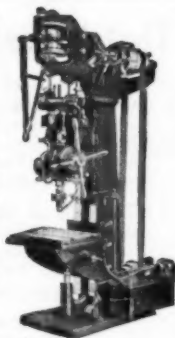
In Milwaukee Since 1884

At one setting of the work

Turner Turret

completes a series of operations! Rotation of turret is automatic—when spindle is returned to its full height, it automatically indexes to the next spindle. Its reversing tap holder backs out automatically when the required depth is reached. Cost of duplicate parts is cut deep. Built with 4 to 6 spindles and to order.

Write for bulletin FH
Bulletin QH for "Quint" Turret

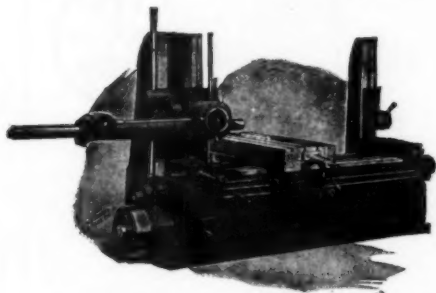


Turner Machine Company
DANBURY, CONN.

The Lambert Horizontal

**A Boring
Drilling
& Milling
Machine**

**That is
Extremely simple
Wonderfully accurate
Under easy control**



A machine of great simplicity, and as accurate as human skill can make it.

Under quick control by two levers which slide along the horizontal bars—one starts, stops or reverses any feed, and the other starts or stops the bar.

Bronze bushings and all-steel gearing. Verniers for making head and outer support adjustments. Arranged for motor drive if desired.

GET THE SPECIFICATIONS

and look them over. There's a reason for the quality and quantity output of this machine. The more you look into it, the better you like it.

Carroll Foundry & Machine Tool Co.

Bucyrus, Ohio, U. S. A.



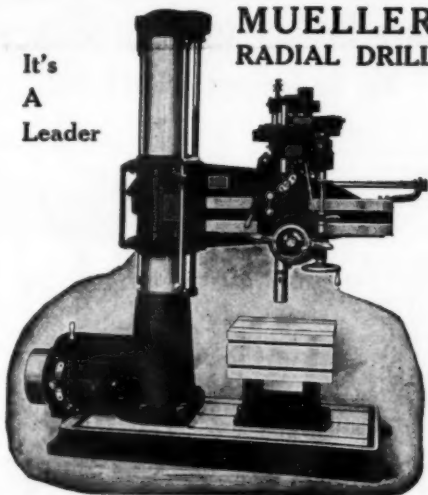
THE SIPP QUICK - CHANGE - SPEED SENSITIVE DRILL PRESS IS DIFFERENT

Speed can be changed in two seconds.
Belt troubles are eliminated.
You get highest belt efficiency.
Belts can be changed in ten seconds.
It is extremely rigid.
It is very sensitive.
The spindle always runs in perfect balance.
It is a Safety First drill.
Let us tell you more about it.

The Sipp Machine Company
Keen Street, PATERSON, N. J.

It's
A
Leader

MUELLER RADIAL DRILL



Mr. Drill User:—

The construction of the gear box on the MUELLER radial drill is remarkably simple. The component parts of it are few in number, but powerful enough to withstand the severest strains without showing the slightest signs of wear. Changes of speed can be instantly made without shock or noise. Superior lubricating facilities are obtained.

There is a reason why everyone boosts the MUELLER radial. Ask us to tell you.

The Mueller Machine Tool Company

Radial Drills and Lathes

ESTABLISHED 1902

CINCINNATI, O.

More Drilling for Your Money

With the Improved AURORA Drill

For the same amount of invested cash or less, you obtain a great deal more in the way of daily output with the fast "Aurora."

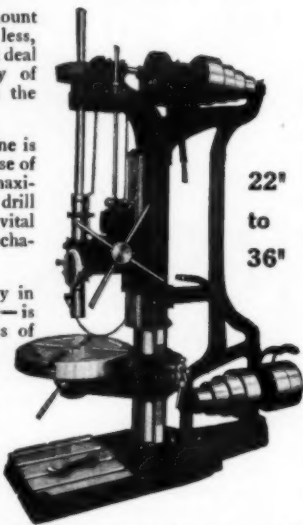
The whole machine is built for the purpose of delivering the maximum power at the drill point—the most vital spot in drilling mechanism.

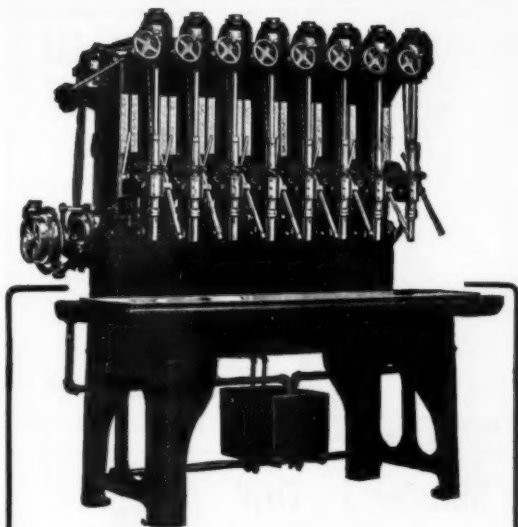
This superiority in power—efficiency—is achieved by means of the unusually large pulley diameter and the consequent ratio of gearing. After exhaustive tests, drilling experts have pronounced the "Aurora" unsurpassed in practical drilling efficiency. The feed box control is right in front of operator.

Other *exclusive* features: Patent tapping attachment; Fool-proof table; Automatic release worm wheel; Enclosed positive gears.

An investigation will well repay you—make it now

THE AURORA TOOL WORKS
Aurora, Indiana, U. S. A.





Write for Catalog of
Henry & Wright 1 to 8 Spindles, for
 $\frac{3}{4}$ " Drills & Smaller

It tells how the gearless power transmission with frictionless bearings delivers the most power at the drill point; how H. & W. Drilling Machines reduce costs to the lowest notch; how the Scientific Feed and Speed Chart, shown therein, has added so much to drilling economies; how to make your drilling cost you less money. Your copy of the Catalog is ready; how shall we address it?

The Henry & Wright Mfg. Co.
 760 Windsor St., Hartford, Conn.

New York Office, Grand Central Palace, 5th Floor

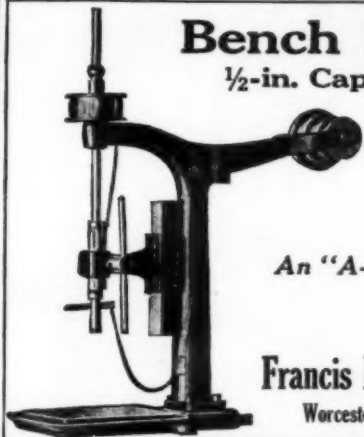
OVER-SEAS REPRESENTATIVE

ALMACOA ALLIED MACHINERY COMPANY OF AMERICA ALMACOA
 51 CHAMBERS ST. NEW YORK, U.S.A.

Principal Foreign Offices: Paris, Turin, Zurich, Barcelona

Bench Drill

$\frac{1}{2}$ -in. Capacity



An "A-1" Tool

Francis Reed Co.

Worcester, Mass.

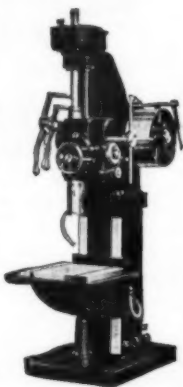
Minster Jr. Drill

Capable of Heavy Boring

A tool of simple and rugged construction, which is particularly profitable in large production shops.

It has 6 speed and 4 feed changes, but any desired speeds and feeds may be obtained by changing gears. This, with its capacity for heavy boring, enables it to cover an unusual range of work.

The speed transmission gears run in a constant bath of oil. Ball bearings throughout insure quiet running. Tapping attachment, compound table and adjustable motor base if desired.



Write for Bulletin No. 30

MACHINE TOOL DEPT.

Minster Machine Co.

Minster, Ohio



**Watch The Corners
Dollars Saved—Dollars Made**

Squeeze Your \$ Of Cost

Get An *Avey* Get all the Profit

**Drive To The Limit
Double Production—Half the Labor**

**The Avey Drilling Machine Co.
Cincinnati, Ohio**



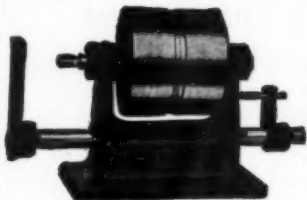
Burke Quality Excels on Fine Points

**Machines of
Burke Quality**
are never built
with any name
cast on the
frame but our
own—

PRICES

Without swinging table.....\$24.
With swinging table.....\$28.
Motor Driven.....\$65 to \$85.

THE BURKE Friction Driven Tapping Machines



The most efficient machines made for work within their capacity. They are complete in themselves, yet cost less than the average tapping attachment.

Send us samples or drawings of your tapping jobs and let us give you production estimates

The Burke Machine Tool Co.
297 East 16th St., Conneaut, Ohio

Model "E-50"

Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Standard speeds 2,100 and 6,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}$ " x 5", and will take work up to $4\frac{7}{8}$ " in height.

Surface of table is ground to insure accuracy.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

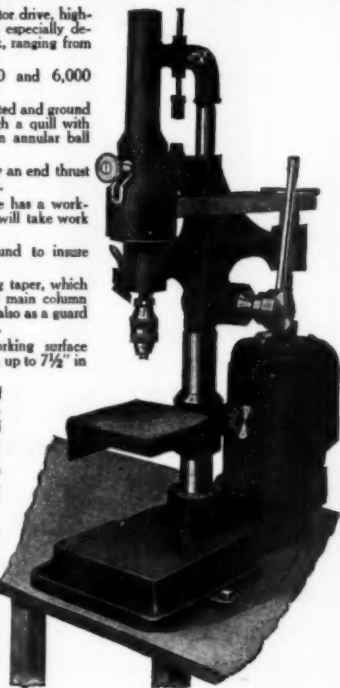
Base has a ground working surface 4" x 6", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitiveness of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.

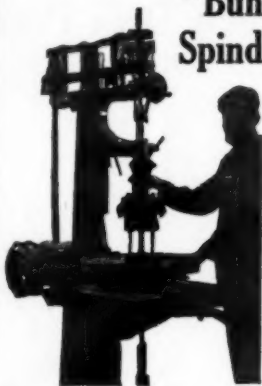


Height over all.....24"
Base..... $7\frac{1}{2}$ " x 18"
Diameter of spindle..... $\frac{7}{16}$ "

Spindle feed..... $\frac{1}{4}$ "
Weight.....62 lbs.
Will drill to center of a 6" circle.

The High Speed Hammer Co., Inc.
Dept. 14
Rochester, N. Y.

"Buhr" Multiple Spindle Drill Heads



The picture shows a "Buhr" drilling six bolt holes in wood wheels at high speed. It has run five years with only one replacement of ball bearings.

We make Fixed Center Drill Heads of all descriptions, both bronze and ball bearing.

Nelson-Blanch Manufacturing Co.

Detroit, Mich.

New York Office:
Grand Central Palace

Madison Adjustable Boring Tool

For Both Rough and Finished Boring



For any kind of boring where cored holes are to be machined.

Particularly useful for cylinder boring in automobile shops.

Quickly adjustable to size. One turn of graduated screw increases cutter diameter .025".

This rugged tool is backed by solid metal, and operates with heavy feed. Can be made with a piloted bar if required.

A new tool that meets a real need. Description and price?

MADISON MANUFACTURING CO., - Muskegon, Mich.



20' Swing

An Incurable Disease Cured

Reason No. 2

The Disease

The present day type of single column 20 in. drilling machine "suffers" from a "malady" known as "bending stress."

Ordinary feed pressure produces this "disease." Its first point of attack is the main column, which becomes sprung.

With each application of feed pressure this "malady" becomes more pronounced and finally destroys completely the perfect functioning of the machine.

Accurate drilling is no longer possible and the machine is useful only for rough work. You purchase a new machine for accurate work only to have it meet with the same fate within a short time.

The Cure

The FRONTIER SUPER-DRILL being the only 20 in. Drill on the market that is equipped with a BACK COLUMN is

"Innocolated"

and is absolutely "immune."

It is impossible to "spring" its Main Column because that BACK COLUMN prevents it.

Perfect accuracy is thus assured.

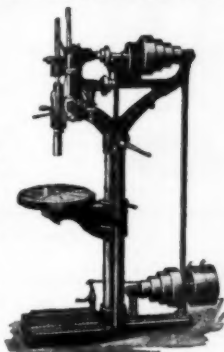
WHEN THE WORKING PARTS WEAR OUT REPLACE THEM WITH NEW OVER AND OVER AGAIN—EACH TIME YOUR MACHINE BECOMES AS GOOD AS THE DAY YOU BOUGHT IT.

YOUR SHOP SHOULD NOT BE A SANITARIUM FOR INVALID DRILL PRESSES.

Call on your local dealer who has one in stock and decide for yourself.

Catalog on Request

Frontier Machine Tool Co., Inc.
130 Lakeview Ave., BUFFALO, N.Y., U.S.A.



A 100% Guaranty



$\frac{1}{2}$ " Size

With Every WODACK Electrical Drill or Grinder

This does not mean merely that we guarantee the material and workmanship against defects, but that we guarantee to every purchaser absolute satisfaction for at least one year. Any trouble with it during that time is our responsibility.

We can do this because no other similar tool in the market offers so much lightness, compactness, durability and performance as the WODACK.

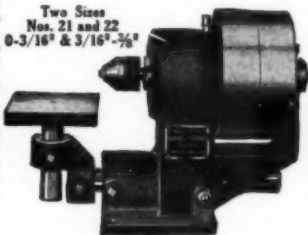
*Get the details today, by writing for Circular Price List
Free for the asking*

Wodack Electric Tool Corporation
31 South Jefferson St., Chicago, Ill.

"B-T" New Tapping Machine Will Reduce Your Tapping Costs

Built into it are not only many improvements found in earlier machines, but it possesses valuable exclusive features which put it easily into the A1 CLASS for superior production efficiency. Drive is very sensitive, and reversing action is instantly automatic—twice as fast as the tapping speed. Its price will surprise you.

Two Sizes
Nos. 21 and 22
 $0-3/16"$ & $3/16"-3/8"$



*Better write for
complete details*

Bicknell-Thomas Company
90 Wells Street, Greenfield, Mass.

Why this all-purpose radial costs less



Our Radial Drill No. 50 is the same type as this No. 51 but has lever feed only.

C-O Self Feed Radial Drill No. 51

*Furnished with 2½
or 3½ foot arm*

This Model No. 51 has four instantaneous feed changes, self-oiling bearings, automatic cut-off and quick return lever on spindle—capacity for drilling up to 1½ inches and 2½ or 3½ foot arm.

HERE is a radial drill with an enormous range of drilling uses and with a great saving in parts, so that it affords you all that is desirable in a radial drill at a lower cost.

Notice that this No. 51 Canedy-Otto Radial attaches to shop wall or to post; that we have eliminated the cost of heavy shaft and base; that it puts your walls or posts to work for you and that it will do practically everything you need done in the way of drilling, from 1½ inches down.

Canedy - Otto POST RADIAL DRILLS

For Shops That NEED a Radial at a Lower Cost

THIS drill is the answer to the problem of shops which absolutely NEED a radial but have found it too heavy an expense. It is strong, simple, compact and made of best material by means of best workmanship. All bearings are hydraulically pressed graphite cones, increasing life of babbitted bearings 300% to 400%.

You cannot make a better investment than this

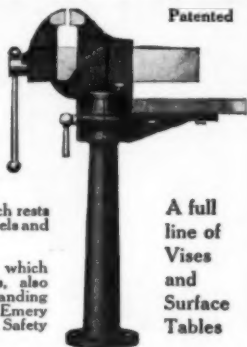
Canedy-Otto Manufacturing Company
General Offices and factory—Chicago Heights, Ill.
New York Office—Grand Central Palace

Champion Adjustable Vise

**Extra Heavy, with
Supporting Column**

This construction solves the problem of extra heavy vises on bench. It has a stem which rests in supporting column. Swivels and locks rigidly.

Write for Catalog No. 18, which describes Champion Vises, also Champion Tool Holders, Expanding Mandrels, Shop Furniture, Emery Wheel Dressers and Cutters, Safety Lathe Dogs, etc.

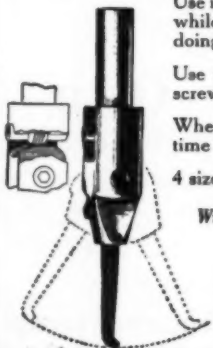


**A full
line of
Vises
and
Surface
Tables**

Every shop should have our Catalog. Write for your copy

Western Tool & Mfg. Co., Springfield Ohio

E-Z-SET Boring Tool



Use it in the tailstock of the lathe while the tool in the carriage is doing a turning operation.

Use it in the drill press; in the screw machine.

Wherever used it will save you time and money.

4 sizes. Straight or taper shank.

Write for circular and price list

**THE
B. & W. Tool & Die Co.
102 St. Clair Ave., N. W.
CLEVELAND, O.**

*The Improved
Wilmarth &
Morman New
Yankee Twist
Drill Grinder*



Twenty-two Years of Leadership

For twenty-two years the New Yankee Twist Drill Grinder has maintained a distinctive leadership and is the recognized choice of more than 14,000 manufacturers.

The New Yankee will readily grind both straight and taper shank drills from No. 52 to 4" sizes and without loss of time with adjustments.

Accurate grinding is so simply accomplished with the New Yankee that drills are constantly kept with the correct angles, proper clearance and equal cutting lips. This speeds production and produces finer work.

Furnished in 9 belt and 8 motor-driven models, all equipped with a built-in wheel truing device.

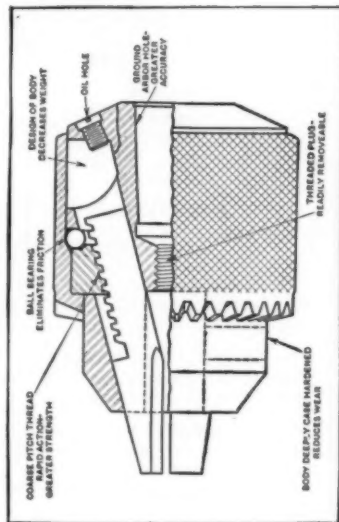
Wilmarth & Morman Co.

Master Grinder Makers

Manufacturers of Precision Surface Grinders, Universal Cutter and Tool Grinders and Drill Grinders

1185 Monroe Avenue, N. W., Grand Rapids, Michigan

The New Jacobs Super Chuck



Patented 1909-1915—Other Patents Pending

ANNOUNCEMENT

ANNOUNCEMENT

We present The New Jacobs Super Drill Chuck—our contribution to greater drilling efficiency—a better chuck even than the Jacobs Drill Chuck you have known and used for the past eighteen years. The New Super Chuck is fitted with ball bearings, is better proportioned, quicker in action, more durable—from all standpoints the best chuck experience has been able to produce, that money can buy. We predict great things for this Super Chuck. You can expect great things from it.

The Jacobs Manufacturing Company

Hartford, Conn., U. S. A.

COLLIS

JUST ANOTHER WAY OF SAYING

QUALITY—ACCURACY—SERVICE



No. 100-D Standard Type Sleeve



No. 100 Use-Em-Up Type Sleeve

STANDARD AND USE-EM-UP TYPES DRILL SLEEVES AND SOCKETS

CHUCK ARBORS
LATHE CENTERS
LATHE BUSHINGS

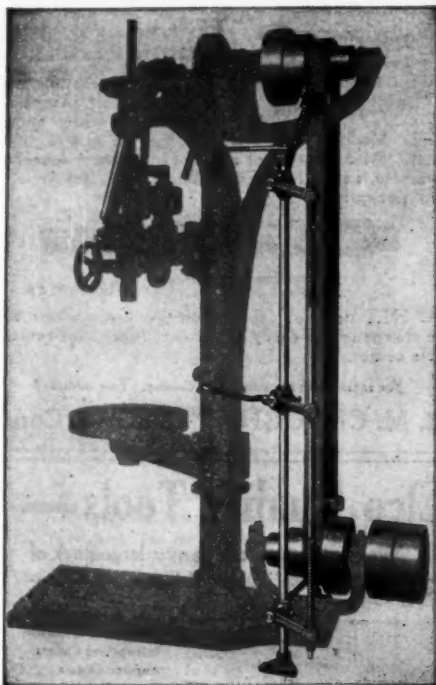
LATHE SOCKETS
HANDLED SOCKETS
DRILL DRIFTS

SQUARE TAPER SOCKETS
B & S TAPER SOCKETS
SPECIAL TOOLS

"WONDER" QUICK CHANGE DRILL CHUCK

Your Jobber Handles Collis Quality Tools

THE COLLIS COMPANY, MANUFACTURERS, CLINTON, IOWA

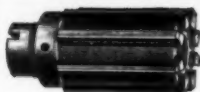


Instant changes of speed for
drill presses increase production
and reduce compensation to injured
employees.

Details in Circular H-D

The Kremer-Cummins Machine Company

1833-35 East 55th St., Cleveland, Ohio



Clough Reamers

Style B Reamer, shown in cut, has all-steel blades of either carbon or high-speed steel. Made in sizes $\frac{3}{4}$ " to 6". Sizes 1" to 6" kept in stock. Also three other styles of high-grade Machine Reamers, as well as Expanding Hand Reamers of superior quality.



Counterbores

DO NOT use dull tools when this Counterbore can be sharpened as easily as a twist drill. Has removable center.

You should have our Small Tool Catalog. Your address?

R. M. CLOUGH, Meriden, Conn.

Elco Quality Tools—

We manufacture and carry a large stock of the following "Quality" Cutting Tools:—



Plain and Side Mills

Inserted Blade Cutters

Interlocking Cutters

Angular Cutters

Special Heavy Duty Under-cut Tooth Mills

End Mills, Reamers, Keyway Cutters and Slitting Saws

May we quote on your next order?

Elco Tool Corporation

720-730 Sixth St.,

Rockford, Ill.

Specialists in Tools, Dies and Fixtures

McCrosky



McCrosky--Super Adjustable Reamers

Have six exclusive features that make them the superior adjustable reamers in design and service. Read the details on page 7 of the new No. 8 McCrosky Catalog.

We have copy for you. Send for it today

McCrosky Tool Corporation

Meadville, Pa., U. S. A.

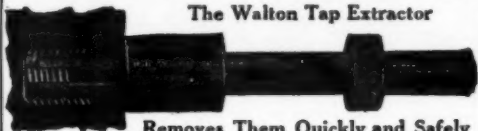
Branches and Agencies in all principal cities

Export Agents: Benjamin Whitaker, 21 State St., New York, N. Y.

COST CUTTING TOOLS

You Need Not Fear Broken Taps

The Walton Tap Extractor



Removes Them Quickly and Safely

This tool is an inexpensive device for removing taps which break at or below the surface of the work. It will enable you to use taps with more freedom, as the broken tap is quickly and easily removed from the hole and without injury to the thread. One of these tools may pay for itself in removing the first tap broken.

Sizes from No. 8 to 1¼"

Folder, or 60 days' trial, or both?

THE WALTON CO., Hartford, Conn.

Eliminate Tap Breakage

Many a tapping job has been a regular tap breaker until the operator tried out a

Woodstock Improved No-Tap-Breakage Chuck



As soon as this chuck was employed, tap troubles were over. This chuck automatically releases tap the minute it binds or strikes bottom. It will enable you to utilize about 99% of the strength of the tap without breaking it. It can be used with any automatic reverse, reversible drill press, tapping machine or lathe.

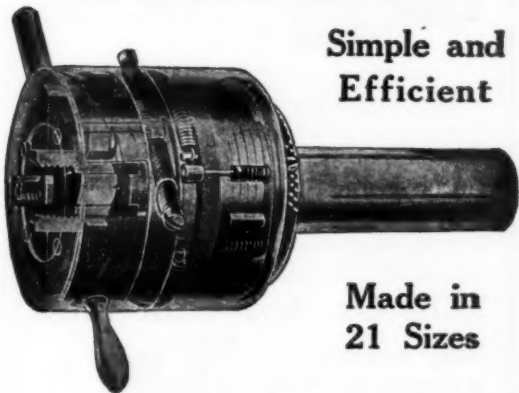
Write for details and trial offer

Peter Bros. Mfg. Co., 115 Railroad St., ALGONQUIN, ILL.

"RICKERT-SHAFER"

Automatic Die Head

**Hits the High Spots of Larger Output
and Makes a Big Cut in the Scrap Heap**



**Simple and
Efficient**

**Made in
21 Sizes**

The R-S Automatic Die Head represents the finished product of exhaustive study by a staff of front rank technical experts. The result?—we have a tool that can thread 70 pipe plugs per hour—16 threads to the inch.

The chasers run in hardened ways. The die is carried on *two* locking pins and the positive opening mechanism prevents chasers sticking. The universal taper attachment cam, adjustable for any taper or length of thread, is specially good where variety of threads is needed. Its simplicity, versatility, capacity and economy put the R-S die head in a class by itself.

*Write for complete description, and tell
us about your threading problems*

Rickert-Shafer Co., 1110 Cherry St., Erie, Pa.

Can You Equal This Easy-Lock Holder and Counterbore Cutter



—for top-quality cutting service? To adjust it you don't have to waste time hunting round for wrenches, hammers or wedges. **One simple twist secures cutter in the holder.** Cutters can be used up to $\frac{1}{3}$ of their length. Adapted also for screw machines and turret lathes. How's that for saving time, labor and good dollars?

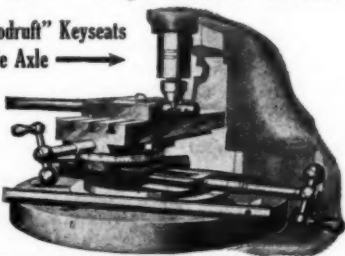
Send for our Illustrated Folder

Manufacturers Machine Products Co.
1320 Mt. Elliott Ave., **Detroit, Mich.**

Mills On Any Drill Press

Cutting "Woodruff" Keyseats
In Automobile Axle →

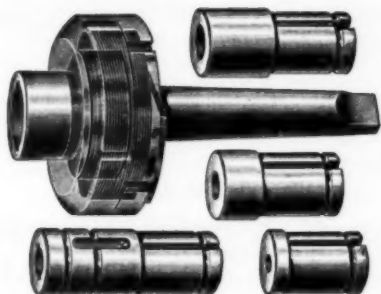
For the
Garage
Diemaker
Repair Shop
Pattermaker



The Davis Milling Attachment and Compound Table can be used on any drill press from 14 to 42-in. swing. It is equally valuable in big and small shops, as it does most of the lighter jobs as well as a large, expensive machine; cuts all kinds of keyseats perfectly. Our cylinder reamers for reboring the Ford car, and our efficient air compressor are also attractively priced. Send for circulars.

Hinckley Machine Works, HINCKLEY, ILL.

"The Safety" **For Quick, Perfect Tapping**



This friction-driven Holder prevents tap breakage, since immediately an undue strain is put on tap it stops automatically before reaching the breaking point, while spindle continues revolving.

Permits tapping to the bottom. It enables you to change from drilling to tapping and vice versa without stopping spindle. All lost motion is eliminated.

It will see you through safely and quickly on your toughest tapping jobs.

Made in four sizes, covering 0 to 2½" diameter.

*Submit it to the most drastic test
It will deliver the goods*

The Beaman & Smith Co.
Providence, Rhode Island

Saves Time Between Cuts

Which Means Money

THE BARKER Wrenchless Chuck



Operated more simply and effectively than an air chuck, and at far less cost. The work is centered automatically, chucked with one movement of the lever, and held with all the pressure it will stand. Gives the operating facility and speed of an air chuck without the cost for installation and maintenance. Made with two or three jaws for all work on lathes, turrets or semi-automatics.

Write for full description

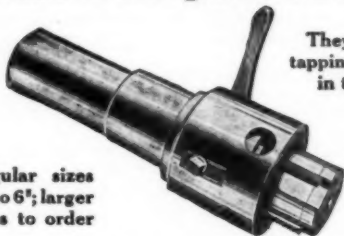
Thomas Elevator Company

CHUCK DIVISION

31 S. Hoyne Ave.,

Chicago, U. S. A.

Victor Collapsible Taps



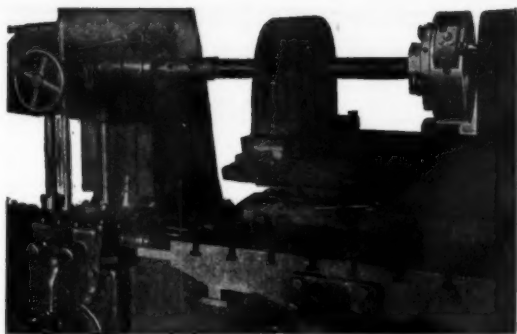
**They cut
tapping time
in two**

**Regular sizes
up to 6"; larger
sizes to order**

These strong and durable tools cut clean, sharp threads without possibility of injury. Easily adjusted for size—either under, over-size or standard. Let us show you money-saving possibilities in tapping, without obligation. The price won't frighten you, either.

Write for description of Victor Collapsible Taps and Self-Opening Die Heads.

VICTOR TOOL COMPANY, - WAYNESBORO, PA.



Mummert-Dixon Facing Heads

In Operation on a Boring Mill

Note how easily the Facing Head adjusts for this work. The tool is fed automatically across the face of the head, working either in or out, completing the operation without change or adjustment. It will do the work accurately and at the same time more quickly and at less cost than any other tool or set-up.

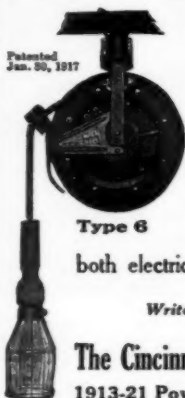
These heads are made in six different sizes, and are available for use on any machine carrying a spindle or that will operate a bar. They work on lathes, milling machines, drill presses, boring machines, etc., and in every case show a decided economy in time used and in the cost of the operation. The ordinary lathe tool is used, and the operation is in effect the same as facing on the lathe.

The virtue in these facing heads is their economy of time and cost. If you will let us, we shall be glad to show you how they can expedite your work and save you money.

Let us have your address, please

MUMMERT-DIXON CO., Hanover, Pa.

Patented
Jan. 30, 1917



Type 6

both electric lamp and power extensions.

"Autex" Extension Reel

Rapidly finding a place in the largest industrial plants, machine shops, service stations, etc., in the U. S. Used for

Write for descriptive circular

The Cincinnati Specialty Mfg. Co., Inc.

1913-21 Powers St.,

Cincinnati, Ohio



SAVE

spoiled work due to poor lighting; Save half the current; Save eye strain; Save Lamp Breakage.

Increase output by having a good light directly on the work; on the thread you are cutting; in the hole you are boring; right at the spot you are working. Instantly adjustable; stays where it is put.

We will send one of these lamps to any plant or factory on approval.

Send for our literature on machine shop specialties.

We make Money Savers.

The Will-Burt Company

Orrville, Ohio

The Catlin No. 8 Keyseater

Greatly Reduces Keyseating Costs

**Simple
Rapid
Productive**

**Cuts Keyseats
1-16" to 1½"**

**Stroke Adjustable
Up to 13"**



Simplicity, ease of operation and maximum quantity and quality of keyseating are the chief merits of the CATLIN NO. 8.

The crank motion enables the cutter to enter the cut at the slow part of the stroke. This is much preferable to the ordinary rack and pinion where the rate of travel does not vary.

It carries ½" to 1½" diameter cutter bars, which are self-contained and have the tool relieving and feeding mechanism.

On some jobs pieces can be keyseated right along without clamping down work or stopping machine.

When belt driven, a 3-step cone provides **THREE SPEEDS.**

Full details gladly furnished on request

Chattanooga Machinery Company
Chattanooga, Tenn.

Abbott Steel Bearing Balls

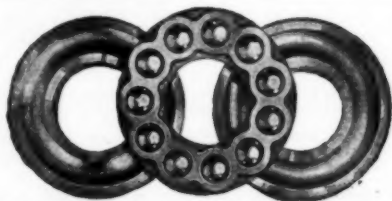
High Grade—Highly Finished



We shall be glad to have your inquiries and make estimates

The Abbott Ball Company

Elmwood District, Hartford, Conn.



THRUST BEARINGS

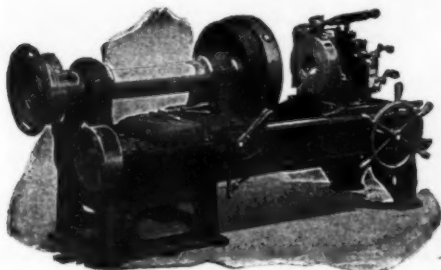
*Flat or Grooved Races
from 1/4" Shaft Dia., Up*

ONE BEARING—OR ONE THOUSAND

THE GWILLIAM COMPANY
BROOKLYN, N. Y. 23 Flatbush Ave.
PHILADELPHIA, PA. 1314 Arch Street
NEW YORK 253 W. 58th Street

In Power Pipe Machinery—

We can serve you most economically
No matter what your requirements



(No. 4 Peerless, Belt Drive. All Gears are Covered.)

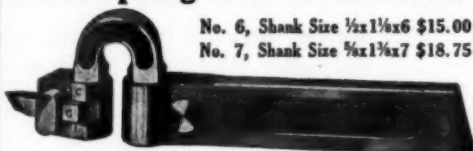
WE ARE SPECIALISTS in the building of pipe threading machines, and now, after some 35 years' experience, our line offers you 17 styles and sizes from which to make your selection.

B. & K. machines have been recognized as standard for many years—they have superior conveniences which enable the average operator to produce easily a maximum quantity of accurate work every day in the year.

*Our long experience is at your command. Let us describe
the machine best suited to do your work—
one that will help you economize*

Bignall & Keeler Machine Works
EDWARDSVILLE, ILLINOIS

Cleveland National Spring Head Tool Holder



No. 6, Shank Size $\frac{1}{2} \times 1\frac{1}{2} \times 6$ \$15.00

No. 7, Shank Size $\frac{3}{4} \times 1\frac{3}{4} \times 7$ \$18.75

For
Broaching,
Cut-off,
Forms,
Gauges,
Keyways,
Radii,
Taps,
Worm or
Square
Threading,
Etc.



Write for
30 days'
trial offer

ALSO
Circulars
of other
Modern
Tool Room
Specialties

The Cleveland National Machine Co.

Dept. T. L., Cleveland, Ohio



Armstrong Clamps and Dogs Drop Forged Steel

All Shapes
All Sizes

Best Quality—Alloy Steel
Screws

Complete Catalog Free



Armstrong Bros. Tool Co.

"The Tool Holder People"

308 N. Francisco Ave., Chicago, U. S. A.

Accuracy In Holes To .0001"

In Size, Straightness, Roundness and Bell Mouth
Secured with equal ease by expert or apprentice



Patented
in United
States and
Europe

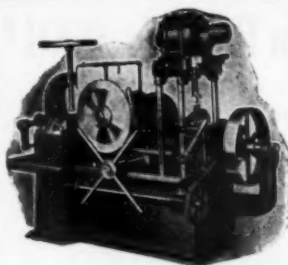
The hole may now be measured more easily and accurately than the shaft

The Bath Internal Micrometer With Master Reference Ring

It does not rest on the high spots in a hole and hide the errors, like a solid plug, but *reveals* them. The operator may know the size of the hole at any time, with the amount of metal removed per cut, and proceed knowingly until the hole is finished without risk of spoiling the work. All users get the same reading—no special skill required. Direct reading to .0001", which may be further subdivided. The Master Reference Ring, which is not subject to wear, is an absolutely reliable, unchanging master reference standard.

*Write for illustrated Bulletin No. 10, which explains
how at last you can easily secure accurate holes*

JOHN BATH & CO., Inc.
Small Tool Department WORCESTER, MASS.



KNOWLTON Cold Saw

Belt or Motor Drive.

Large Capacity.

Fast Cutting.

Easy to operate.

Handles all shapes.

Unexcelled for sawing
metal bars, Structural
Steel and Large Pipe.

Circular on request

Knowlton Machine Co., Westbrook, Maine
Domestic Dealers

III. Clarke & Co., Boston; Barbour, Love & Woodward, New York City; Banks Supply Co., Huntington, W. Va.; Herberts Machinery & Supply Co., San Francisco and Los Angeles; Wolverine Machinery & Supply Co., Detroit; Frank Toomey, Inc., Philadelphia; Brown, McDonald Mch. Co., St. Louis; General Machinery Co., Spokane; Sunderland Mach. & Supply Co., Omaha; Northern Machinery Co., Minneapolis; Federal Machinery Sales Co., Milwaukee and Chicago; The National Supply Co., Toledo; McMullen Machinery Co., Grand Rapids; Kemp Machinery Co., Baltimore; Neill-LaVie Supply Co., Louisville; Day Machinery Co., Buffalo; Young & Vann Supply Co., Birmingham, Ala.; The Patterson Tool & Supply Co., Dayton

Peerless ^{HIGH SPEED} Hack Saw Machines



Meet the needs of
your shop for a re-
liable, straight cut-
ting, fast sawing
machine that gives
more cuts per blade.
Sizes, 6"x6", 9"x9",
13"x16".

Note the overbal-
anced saw frame
and guide. Feed
control from 6 lbs. to
170 lbs. by 6 lb. steps.

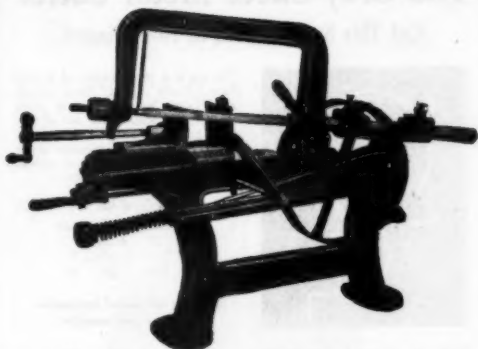
Six-speed machines for
cutting metals of var-
ious hardnesses.

Motor mounted ma-
chines for use in out-of-
the-way places.

Peerless Mch. Co.
1609 Racine Street
RACINE, WISCONSIN

Right Hand View 6"x6" Belt Drive

Every Shop Needs A Hack Saw



Marvel Draw-Cut Hack Saw No. 2

With Swivel Vise that Swivels Both Ways

The No. 2 is a general work saw in use all over this and foreign countries. **THE PRICE IS LOW.** We make a smaller size still lower in price. And we make high speed saws, metal band saws, punches, shears, drill press vises.

***INVESTIGATE THEM NOW**
by sending for our catalogue
that gives all the details*

Armstrong-Blum Mfg. Co.
341 N. Francisco Ave., CHICAGO, ILL.

The Gray Sheet Metal Cutter

Cut This Steel Pattern in 10½ Minutes



This cut is a reproduction of a steel plate 12"x15", 3-16" thick, which the "Gray No. 1" cut in 10½ minutes, and without the aid of any other tool. *It is not a rotary shear.* It does an unlimited scope of work for which a shear is useless. Feeds like a sewing machine.

Respective capacities of Nos. 0, 1, 2 and 3:

18"	throat,	1/8"	plate
34"	"	3/16"	"
36"	"	3/8"	"
36"	"	5/8"	"

Shall we tell you of its wonderful range and rapidity?

W. J. SAVAGE CO., Knoxville, Tenn.

PETER BROTHERS'

Abrasive Metal Cutter

Will Save You 5 Hours Every Day

It makes a quick, clean, smooth, straight cut thru hardened steel, brass, copper, aluminum, and any other tough metal. It does not nick or waste metal, *nor spoil the temper.*

Ball bearing—easy running. Simple to operate, highly efficient, and low in price.

8" Size \$22.50, with C. S.

Splendid for tool room. Cuts high-speed steel up to 1" square.

12" Size \$60, with C. S.

Cuts up to 2½" diameter, round or square, at any angle up to 45 degrees. Ball bearing.

15 Days' Free Trial

Write us or ask your dealer

PETER BROTHERS MFG. CO.
115 Railroad St., Algonquin, Ill.



Don't Waste Time and Money Driving Screws By Hand



Screws delivered
to and driven
from this point

Drives machine screws, wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.

Follow the example of your competitors and install Magazine Fed Screw Driving Machines

THE REYNOLDS MACHINE COMPANY

Dept. H. H.,

Massillon, Ohio

"Poorman" Sheet Metal Working Machinery

Squaring Shears—84 Sizes Gap Shears—21 Sizes Corrugating Rolls
Crimping Rolls Forming and Roofing Presses
Conductor Pipe and Trough Machines, etc.



The Streine Tool & Manufacturing Company
New Bremen, Ohio, U. S. A.

"QUICKWORK"

Registered in U.S.A. and Foreign Countries

Rotary Shears

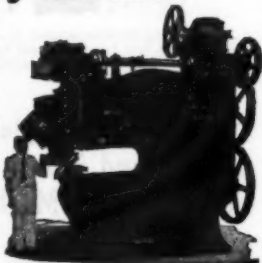
Made in 7 Sizes

Cut all gauges of sheet and plate metal up to 1 inch thick in straight or irregular shapes and openings without cutting in from side of sheet. Leaves square, true edge that requires no finishing. Used in building ships, boilers, tanks, cars & general plate and sheet metal work.

Save 50 to 90%

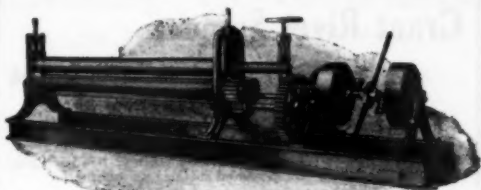
Eliminates Oxyacetylene cutting and plate planing

Write for catalogue No. 60



Patented June 3, 1913; Aug. 26, 1919.

THE QUICKWORK COMPANY, St. Marys, Ohio, U. S. A.
Cable Address "Quickwork," "W. U." and "General" Codes



Pyramid Type Plate Bending Rolls

These Rolls are carefully designed so that the strains incident to heavy bending are properly distributed among the various parts, thus giving each part and the machine, as a whole, the requisite strength.

The upper roll is adjustable and, in accordance with the best practice, is larger than the other two. The outer housing is hinged, which, in connection with a device for raising the outer end of the upper roll, permits the removal of cylindrical pieces when finished. A four-inch opening between top and bottom rolls provides for the use of wooden forms.

Made in 17 sizes with capacities up to $\frac{1}{2}$ in. and from 50 to 98 in. in length.

Hendley & Whittemore Co.
100 S. State St., Beloit, Wis.

Grant Rivet Spinner



An unequalled combination in speed,
finish, uniformity and silence

Speed: One rivet per second.

Finish: Perfectly formed heads; highly
polished surface; no tool marks.

Uniformity: Each rivet headed with the
desired tightness or looseness.

Silence: It is noiseless.

And it does not require high-priced labor.
A woman or girl can secure maximum
results.

*Write for Catalog, or send us a
sample of your work, or both*

The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.



Belt Driven

DUPONT Power Hammers

Belt or Motor Drive

For general forging and
tool dressing.

They embody a design and
workmanship that are un-
surpassed.

Send for Bulletin

United Hammer Co.
45 Bromfield St., Boston, Mass.

Riveting Revolutionized

"The Hammer with the human stroke"

Heads Rivets Cold



Heads 'em tight or loose, flush, countersunk, or finishes heads any shape desired at the rate of:—

A rivet a second, sizes up to 3-16 in.

A rivet in two seconds, sizes 1-4 to 3-8 in.

A rivet in three seconds, sizes 7-16 to 5-8 in.

Built in Eight Sizes

To handle rivets from the smallest, up to $1\frac{1}{2}$ " in diameter. Send us sample assembly parts with rivets or sketch of your work, and let US shoulder your riveting problems.

Send for the High Speed Hammer Book

Department 13

The High Speed Hammer Co., Inc.

Rochester, New York

“Hold-Em-All” Tool Holders

Holds any shape stock.

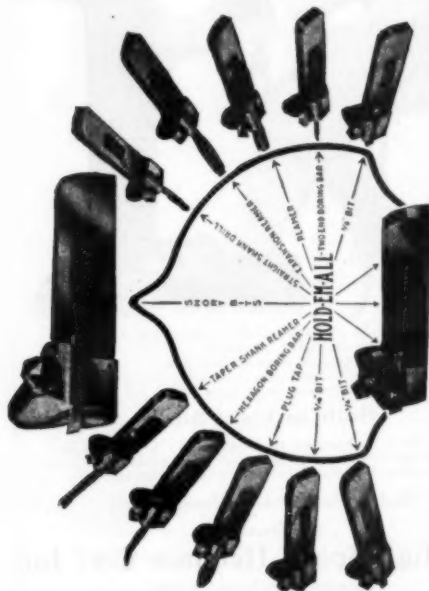
Holds short bits.

Combines many in one.

Made R and L hand,
Off-set and S shanks,
and conform to all types
of other makes.

Write for Catalog

SIMMONS ECONOMY TOOL CORP.,
ALBANY, N. Y.
CONSULT YOUR SUPPLY HOUSE



**It's the
BLOW
that counts**

Nazel Air Hammer

**Six Sizes
Belt or Direct
Motor Drive**



Powerful Clinging Blow—Positive Control

A Hammer and Compressor combined in a single unit.
Makes its own air as fast as it is used.

Strikes a clinging blow which necessitates fewer reheats
—therefore, greater production.

The force of blow is under the instant and easy control
of operator without changing number of blows per minute.

As three forces unite in forcing down the ram, it oper-
ates with minimum power and at highest efficiency.

The Nazel Hammer book explains; write for it

**Nazel Engineering & Machine Works
Niketown, Philadelphia, Pa.**

Your foreman and master mechanic will be interested in

The Broach Well Keyway Set

Used under an arbor press, these tools will cut smooth, accurate keyways, cheaply and quickly.



Patent Pending

An illustrated circular descriptive of the tool and its uses mailed on request.

Velco Manufacturing Company, Inc.
Greenfield, Mass.

KEYSEATS

That
FIT

Are Milled With This
Internal Keyseater

Get Circular O

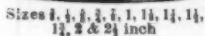
National Machine Tool Co.

2268 Spring Grove Ave.,

Cincinnati, O.



sold last year, we were not asked for a single replacement



Let us solve your universal joint problems as we have for others. We shall be pleased to have the opportunity; you will be pleased with the results.

Winning out against 65 competitors, with the joints driven at a compound angle under maximum strain, can mean nothing else than **superior design and construction**. And the fact that out of the thousands sold last year we were not asked for a single replacement, means **proven reliability**. Can you ask for a better combination of good qualities?

Price list and complete data gladly furnished

The Borgeson Manufacturing Co., Inc.
Torrington, Conn.

HOLLOW BORED FORGINGS AND STEEL SHAFTS



These include *Lathe Spindles, Piston Rods, Clutch Shafts, Steel Pipes, etc.* May we have your blue prints? We offer you high grade service at very attractive prices.

A trial order will convince you. Write

American Hollow Boring Co.
Erie, Penna.

Reduce 10' to 20' of Stock a Minute



With the Etna Rotary Swager

Work can be passed through the "Etna" at the rate of 10 to 20 running feet per minute, depending upon the kind of material and the diameter.

The "Etna" has a hammer action of immense force and extreme rapidity. This method allows the dies to strike about 3,000 blows per minute, as compared with 400 by the next best method. *The economy is obvious.* In many cases the "Etna" has replaced power hammers and has increased production 5 to 10 times. It outlasts any other swager built.

Regular sizes swage $\frac{1}{4}$ to $4\frac{1}{4}$ " diameter. Catalog?

The Etna Manufacturing Co., TOLEDO,
OHIO

The ideal compound—



for your case hardening

This scientifically prepared material is rapidly replacing cyanide in thousands of factories because it is more efficient and economical, and being non-poisonous, it is perfectly safe to use.

Ferro Case is regularly specified by railroads, machine shops, mills and manufacturers of automobiles, tools, typewriters, sewing machines, mixing and grinding machines, separators, conveying machinery, electrical devices, etc., etc. It is made in two grades:—Ferro Case M is for use in any style or make of cyanide melting furnace, and is handled in the same way; Ferro Case S is sprinkled upon the red hot steel or iron.

For your pack case-hardening you will like

Tri. B. Brand Pack Carbonizer

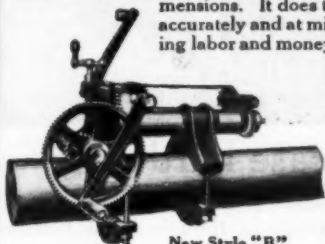
It's a light, fast, long-lived carbonizing agent for use in boxes in a muffle furnace. This, and our other case-hardening materials, will give you absolutely full value for every dollar expended. We solicit a trial order.

C. G. Buchanan Chemical Co.

Sta. H., Cincinnati, Ohio

A Strong Portable Key-Way Cutter

This handy little tool is easily taken right to the job where it cuts key-ways of just exactly the right dimensions. It does the work quickly, accurately and at minimum cost, saving labor and money. Just clamp the

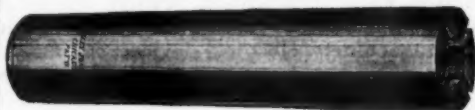


New Style "B"

tool to the shaft and turn the crank.

Style "B" has six milling cutters and cuts keyways from $\frac{1}{4}$ " to 2" wide, in shafting 2" to 8" in diam. and 12" long without resetting.

THE BUCHER-SMITH CO.
East Liverpool, Ohio



"Wear-Ever" Woodruff Chuck And Keyway Cutter

The "Wear-Ever" Woodruff Keyway Chuck insures a positive drive and true-running cutter. Eliminates making collet chucks. Fits all standard makes of milling machines, and is made in all tapers, such as Brown & Sharpe and Jarno tapers.

Let us supply you with cutters
No extra charge for the square

Centers by the shank



Drives by the square

SCULLY-JONES & COMPANY, 555 Railway Exchange Bldg.,
CHICAGO, ILL.



Save some money
in these days of
readjustment by
installing a

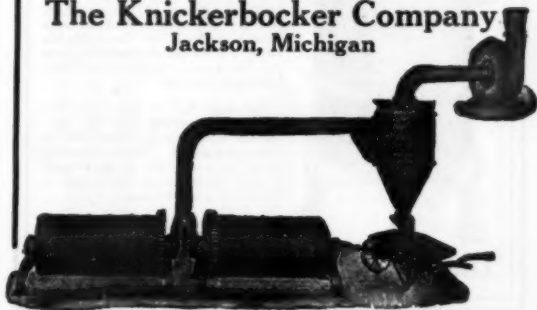
"Rarefied" Dust Collector

OF COURSE, you may need more than just one—they are being used in groups of from 2 to 26, and they are in these various plants *because the first one made good.*

"Rarefieds" are operated on the partial vacuum principle. They collect all dust heavier than air, and they do it with less power, often at a saving of 50 per cent. There's no filling up of cloth or screens, no cutting out of fan, and no cleaning out by hand. Repairs are reduced to practically nil.

*Here's a sure saving for your plant—
Let us forward full particulars and price*

The Knickerbocker Company
Jackson, Michigan



COOPER UNIVERSAL JOINTS FLEXIBLE COUPLINGS

"YOU CAN'T BREAK THEM OR WEAR THEM OUT"

Smooth; neat; only 5 simple parts; large oil space;
working surfaces case-hardened; no limit to size;
guaranteed stronger than shaft at any angle.

6 PATENTS



Three hundred years ago Hooke invented the Universal Joint with fixed centers. Three hundred years have elapsed and still the Hooke type of universal joints are burning up power and breaking in operation.

The Cooper Patented Universal Joint with no fixed centers is just as frictionless as the crosshead of an engine at any angle. **"You can't break them or wear them out"** with shafts joints are bored for. Perfect lubrication at any speed.

Sizes $\frac{1}{4}$ " to 2" in stock bored to fit YOUR shafts.

Send for one and try it out

Cooper Flexible Transmission Co., Inc.
1723 8th Ave., Brooklyn, N. Y.

Here's the Heat-Treating Furnace You Are Looking For—WHY?



Because the TRIAD 3-Purpose Furnace performs quickly, efficiently and simultaneously **THREE OPERATIONS**: (1) Heats charcoal pot for Lead Bath; (2) Heats dies and tools in Semi-Muffle Chamber for hardening; (3) Gets welding heat for forging in Combustion Chamber.

Not only that, it gives you this **superb threefold quality service** at a saving of above 60% in fuel costs alone. There is but one heating unit—oil or gas—and burner being outside furnace, back-firing is avoided.

Get our Catalog No. 5

The W. R. Bennett Co., P. O. Drawer X
Elmwood, Conn.

Tucker Oil Hole Covers

Pat. Mar. 30-1915

For all purposes, where oil is used as a lubricant. Every cup a practical device.

Send for Catalogue
Oil Hole Covers No. 6



Style G, Closed



Style G, Open



Style C

Style E



Style F, Drive



Style A



Style D, Open



Style D, Closed



Style B



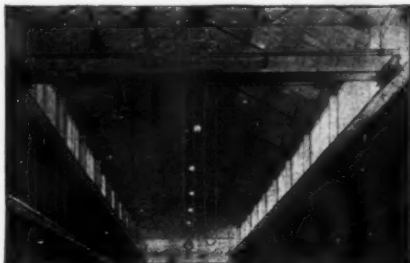
Rotary Head

W.C. & F.C. TUCKER, Hartford, Conn.

Dependable Service

is guaranteed with every EUCLID crane and hoist.

Write for catalogue today



The Euclid Crane & Hoist Co.
EUCLID, OHIO

A Crane, Hoist and Truck—

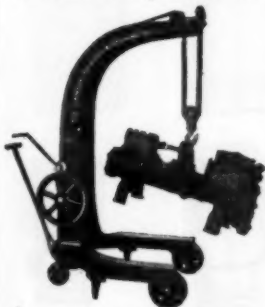
The "CANTON"

Is "The Handiest Tool in the Shop." In handling weights up to 6,000 lbs. the "Canton"

Does the Work of 6 to 10 Men

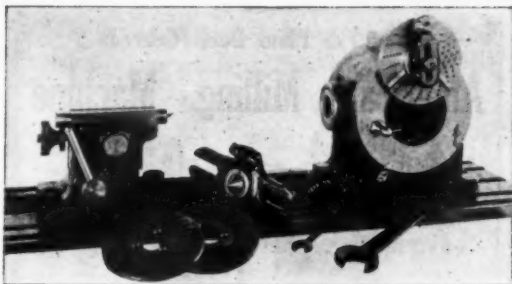
A splendid auxiliary to the overhead system in large shops, and indispensable in smaller ones. Takes the load anywhere at a big saving in labor.

*Many sizes. Write
for Booklet E-8*



Canton Foundry and Machine Co.
Canton, Ohio

New York Office: 45 West 18th Street, Second Floor



Plain Index Centers Swing 10" Diam.

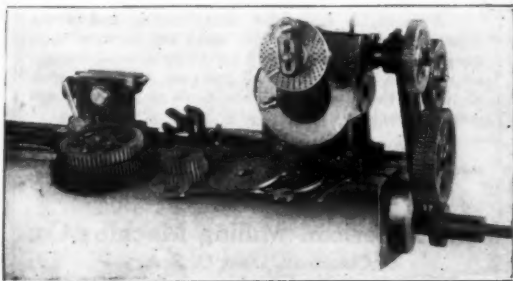
SIMMONS OF ALBANY

These Dividing Heads or Index Centers may be used on any milling machine; are well designed; materials are the finest obtainable.

The Universal Index with Spiral Cutting Attachment is a quite recent development and will be found remarkably useful in any tool-room. Let us tell you more about these accessories.

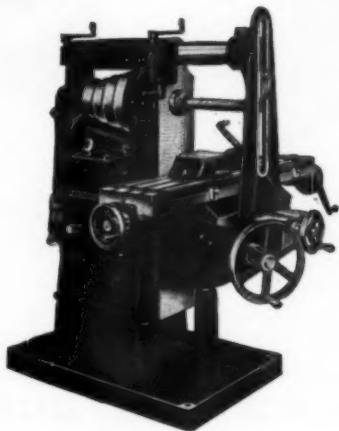
SIMMONS MACHINE CO., Inc., ALBANY, N. Y.

BRANCHES: 801 Singer Bldg., New York, 86-88 Exchange St., Buffalo, N. Y.
Albany and Buffalo Warehouses



Universal Index Centers with Spiral Cutting Attachments

No. 1½ Plain Back Geared
American Milling Machine



Strong—Rigid—Quick—Accurate

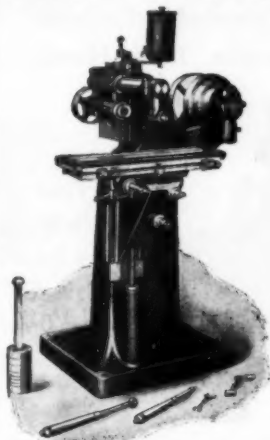
A thoroughly dependable manufacturing tool of the highest type. It is strong, rigid, quick and accurate, with every operating convenience. It has plenty of metal, bearings are wide and bronze bushed, all steel gears are heat treated, all running shafts are ground, alignments are accurate, adjustments simple, etc., etc.

*A **Swivel Vertical Milling Attachment** is furnished, if desired, for all classes of vertical milling.*

May we send specifications and complete description?

The American Milling Machine Co.
Cincinnati, Ohio, U. S. A.

Why waste expensive power by doing small milling jobs on large heavy duty millers?



**No. 1
U. S.
Improved
Hand
and Weight
Feed
Milling
Machine**

This new improved Hand Miller has wide range and capacity, combined with ready adaptability. It has also more power than any similar machine of its size. The result is that it can take care of an unusual variety of small milling operations at a big saving in production costs compared with what is possible on large, expensive, heavy duty millers.

The following attachments and accessories are furnished if desired: (1) universal milling attachment—for die sinking, profiling, etc.; (2) plain milling attachment; (3) full outfit of accessories. Can be arranged for motor drive and oil pump attachment.

It will well repay careful investigation

The United States Machine Tool Co.

Cincinnati, Ohio, U. S. A.

Cheaper Drilling—

With U. S. Patented Adjustable
Multiple Spindle Drill Heads



Also Fixed
Spindle Heads
of any Practi-
cal Type
Made to Order

The outstanding feature of this new modern Drill Head is its PATENTED double adjustment of spindles, an improvement not incorporated in any like tool made. This insures drilling holes in squares, triangles, ovals, straight line work and irregular lay-outs of almost every description.

Nos. 1, 2, 3 and 3-A have from two to six spindles. Special Adjustable Heads built to order. No. 4 has four spindles, with single adjustment, for drilling evenly spaced holes in groups of four for pipe fittings, flanges, etc.

U. S. Drill Heads are spur gear driven and operate with the adaptability of universal joints, only they are stronger and more compact.

Without obligation send blue prints of your work and our engineers will make an estimate of your requirements

The United States Drill Head Co.

Cincinnati, Ohio, U. S. A.

Moback Cutters

**With Inserted and Adjustable Blades
Multiply the Buying Power
Of Your Money**



The MOBACK FACE MILL, shown in cut, has a high grade carbon steel holder, and with ordinary care stands up under the most rigorous milling service indefinitely. The cutting blades are made of the best modern high speed steel.

For maximum economy it has solid high speed steel cutters backed clear off the boards. The MOBACK also eliminates the frequent necessity of having to scrap costly solid cutters, and its price is lower.

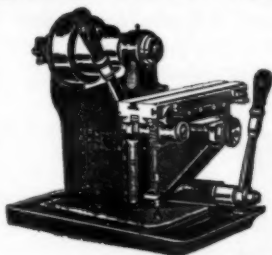
The adjustability of blades insures 100 per cent increased milling service. One set of blades in the MOBACK FACE MILL outlasts two solid cutters. New blades can be inserted at small cost.

These exclusive improvements are also embodied in both the Moback End and Side Mills. Why indulge longer in the economic waste involved in using the expensive solid high speed steel cutters?

Careful investigation of these superior cost-reducing tools will well repay you. Send postal today.

Moback Tool & Machine Mfg. Co.
330 Atlantic Ave., **Boston, Mass.**

Just The Machine



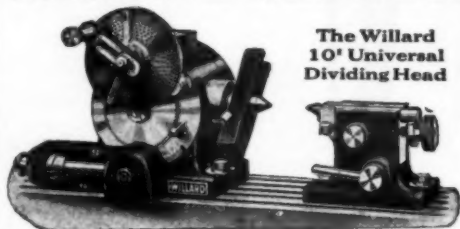
for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for descriptive circular

The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.

Takes Care of Heaviest Cuts



**The Willard
10" Universal
Dividing Head**

Ruggedly built for the toughest work encountered in dividing any job on a plain miller. Centers swing 10" in diameter. The graduated swivel is adjustable 10 degrees below horizontal to 10 degrees beyond vertical. Clamping device specially rigid. Spindle has No. 10 B. & S. taper and a straight bore 1-1/16" in diameter. Locking device prevents all strain on worm, worm wheel and index pin while cutting. *Full details on request.*

THE WILLARD-MIDDLETOWN MACHINE CO., Cincinnati, O.

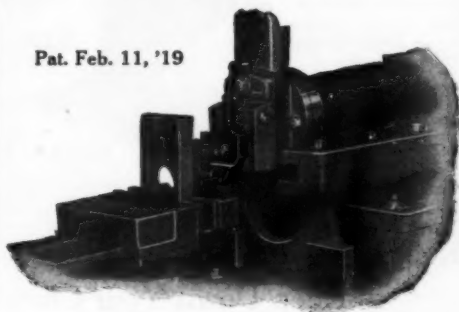
Successors to The Willard Press & Tool Co.

BRUNO

Slotting Attachment

for Shaper and Planer

Pat. Feb. 11, '19



A cutting tool holder which converts your shaper into a Horizontal Slotter and makes possible the most intricate shaping such as is required for dies, jigs, gauges, keyways, slotting, etc.

Write for circular. Dept. H.

H. A. MOORE CO.
ROCHESTER, N. Y., U. S. A.

Burke Bench Millers

**FOR
Accuracy
Convenience
Economy**

On small milling operations, where accuracy as well as production must be had, are the places to use Burke Bench Milling Machines.

*Built in various sizes,
both hand and power
feed, and at prices
ranging from \$100 to
\$220.*

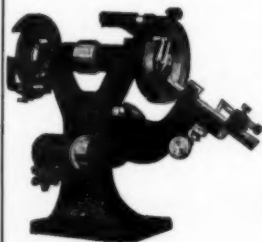


\$220.

BURKE No. 4

The Burke Machine Tool Co., 297 E. 16th St.
Conneaut, Ohio

Keep Up Your Tools Keep Down Your Costs



with

**Grand Rapids
Drill Grinders
Tap Grinders
Universal Grinders**

which

Give Perfect Results

Catalog on Request

Grand Rapids Grinding Machine Co.

17 Ottawa Ave., N. W., Grand Rapids, Mich.



Terrell's Steel Lockers

Mean
Economy
and
Modern
Efficiency

PERMANENT, FIRE-PROOF shop furnishings afford the same degree of economy and modern efficiency as permanent, fire-proof buildings.

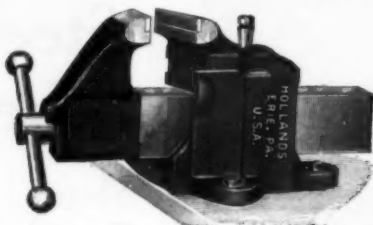
TERRELL'S STEEL LOCKERS have the economy of permanent, fire-proof construction, and they are efficient because (1) They are sanitary; (2) They keep their contents safe from meddlers and thieves; (3) They add much to the prosperous appearance of the shop, and (4) They increase the good will of self-respecting workmen. They are made in a variety of sizes and styles, single or double tier, and adapt themselves to available spaces and meet special conditions at moderate cost.

*Write for estimate on filling your requirements
The obligation is ours to make good—not yours to buy*

Terrell's Equipment Company
Hall & Division Sts., Grand Rapids, Mich.

Hollands Vises

Have made good
for 33 years

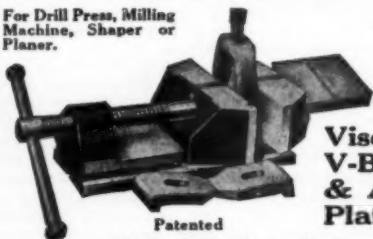


HOLLANDS VISES are made with solid or swivel jaw and stationary or swivel base, and each is a leader in its class. Machinists' Vises, Filers' Vises, Woodworkers' Vises—what do you need? Write for latest price list.

Hollands Tool Co., (Established in 1887) Erie, Pa.

G-S Combination Vise

For Drill Press, Milling Machine, Shaper or Planer.



A
Great
Time
And
Labor
Saver

Vise
V-Blocks
& Angle
Plate

Patented

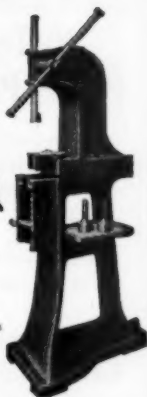
	No. 1.....	Dimensions.....	No. 2	
Increases	5"	Jaws Open.....	7"	
& Improves	2 1/2"	Depth of Jaws.....	3"	
Output	8"	Width of Jaws.....	9 1/2"	
	1 1/2"	Jaws Overhang.....	2"	
	65 lbs.	Weight.....	105 lbs.	

30 Days'
Free Trial
Write for
Particulars

GERMANOW-SIMON MACHINE WORKS 68 MILL ST., ROCHESTER, N. Y.

*This shelf can
be adjusted for any
length arbor*

Stands for *Nicholson Arbor Presses* are equipped with adjustable shelves to accommodate any length of arbor or shaft. Or the shelf can be taken out entirely, without danger of misplacing it, for it is chained to the frame. Just one of the exclusive features that make the *Nicholson Arbor Press* an unusually efficient time and labor saver.



Nicholson Expanding Mandrels

SAVE SPACE—A set of nine does the work of several hundred solid mandrels.

SAVE TIME—Instantly fit any hole, round or square, from $\frac{1}{2}$ " to 7".

SAVE LABOR—No need to caliper or turn down a dozen or so of solid mandrels to get one that fits.

*Write for details of 30-day trial offer.
No obligation, of course.*

W. H. Nicholson & Co.
117 Oregon St., Wilkes-Barre, Pa.

Agencies:

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Ludgate Square, London, E. C.

BURTON FILS
68 Rue des Marais,
Paris, France

MONTI & OSCURO
Milano, Italy

ANDREWS-GEORGE CO.
16 Takegawa-Cho, Kiobashi-Ku
Tokyo, Japan

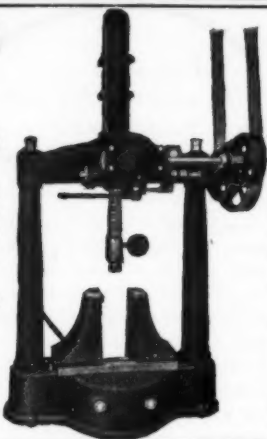
ATLAS

30 Ton Power Press

will give you
greatest possible
efficiency on your
production work.

*ATLAS Presses are built
in all sizes and types.*

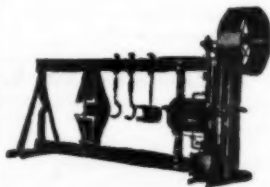
Atlas Press Co.
Kalamazoo, Mich., U.S.A.



Lourie Hydraulic Presses

Are Known the World Over

We manufacture a complete
line of standard hydraulic
presses.



We also make
special presses.

Write for catalog

Lourie Mfg. Co.
Springfield, Ill.

A Two- in-One Arbor Press and Straightening Machine

Of
"TOWSLEY"
Quality



Capacity, 48" between centers.

Straightens round bars up to 2½" diameter.

Straightens pipe, tubing, crank shafts, etc., up to 8" diameter.

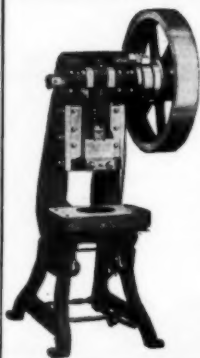
By combining two machines in one, we can make it of better quality than the usual single-purpose machines and still offer it at a reasonable price. It is well manufactured of high-grade material, carefully fitted and nicely finished like a machine tool.

As an Arbor Press it is better than you have been accustomed to. As a Straightening Machine it is just the thing for taking bends and short kinks out of stock before turning, for repair work on journals, spindles, shafting and axles, as well as bending and straightening tubing, channel, angle and tee iron, etc.

Description and close price for the asking

JOHN T. TOWSLEY MFG. CO., 1036 Woodrow St.
CINCINNATI, O.

Here Is A Press



With Plenty of Steam
Back of THE PUNCH

HIGH DUTY
ROCKFORD
PUNCH PRESSES

Made in straight side and inclinable types. Their great power backed by rigid design enable them to do the work you demand and stand up to it.

Write For Catalog

Rockford Iron Works
Rockford, Ill.

A Superior Power Press —the Willard



It features many up-to-date practical improvements, and all parts are interchangeable. The advantage it offers in being able to incline it for operating dies gives it a clear superiority over other types. Adapted for all kinds of blank cutting, punching, perforating, forming and bending.

Safety lock enables operator to lock clutch bolt securely in collar so dies may be perfectly secured. Positive safety stop of latch prevents press from "repeating."

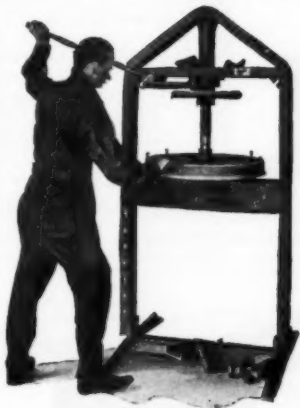
Write for specifications

The Willard-Middletown Machine Co.
Cincinnati, Ohio

Successors to The Willard Press & Tool Co.

WEAVER

Forcing Presses



are saving time
and money and
improving the
quality of work
in thousands of

**Garages
Electric
Shops
Machine
Shops
and
Factories**

because of their wide range of application to both
bulky and small work, due to their

**Great Depth Adjustment
Quick Release Feature
and Enormous Leverage**

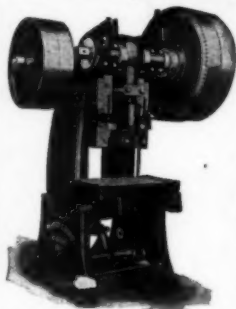
enabling the operator to exert a pressure of 28 tons
without assistance. For complete description and
prices, write for catalogue.

WEAVER MFG. CO.

HARVARD PARK,

SPRINGFIELD, ILLINOIS

L-J Heavy Inclinable Power Press



Cut shows No. 5 Combination Geared, capacity 52 tons pressure. It embodies every modern convenience necessary for accurate and rapid production, as well as safety to operator and dies. Unrivalled for simplicity, rigidity and power.

Our Dealers

Herberts Machinery & Supply Co.,
San Francisco and Los Angeles, Cal.
Northern Machinery Co., Minneapolis
Brown Machinery Co., St. Louis
English Tool & Supply Co., Kansas
City, Mo.
Stocker-Rumely-Wachs Co., Chicago
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Joseph Beal & Co., Boston, Mass.
Dale Machinery Co., Inc., New York
J. L. Lucas & Son Inc., Bridgeport, Conn.

Write to the nearest, or

Loshbough-Jordan Tool & Mche. Co.

Elkhart, Indiana

Weigel Double-Wheel "Trukaster"

Has heavy plates and axles. Easiest running, strongest and most durable double-wheel caster made. Lasts three times as long as others.

"Kwality Kaster"

(See Illustration)

The strongest and most durable single caster. Won't crush or break. Swivels on steel machined rollers.

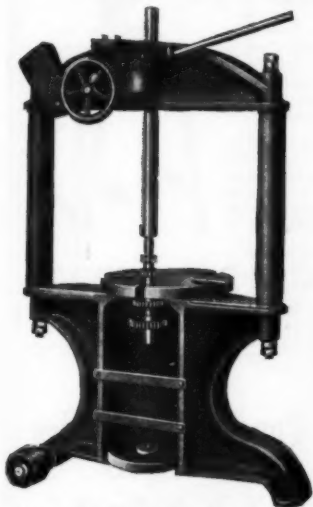
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**THE HAMILTON
CASTER & MFG. CO.
HAMILTON, OHIO**



An Arbor Press for Auto Work?

Greenerds Also Excel in that Line—



Built
in All
Sizes

for

Pressures
from
15 Lbs.
to
40 Tons

GREENFRDS make good in all factories and shops, including automobile shops of every size and description. One writer in an automobile journal lists 19 separate operations in which arbor presses are superior for what he calls "well-done-the-first-time repairing."

They are just what you need for taking cars apart without injury to the parts, for straightening axles, for removing gears from transmission countershafts, for reassembling—too large a list of time-saving and parts-saving operations to list here.

Our Catalog shows a number of special presses and attachments that are eye-openers—usable in *all kinds* of machine shops. Send for your copy today.

EDWIN E. BARTLETT, Nashua, N. H.

Partridge Light Punch Press

For making novelties from sheet metal, including such operations as stamping, blanking, piercing, bending, forming, perforating, embossing, shearing and wire cutting. Has exceptional strength for its size.

Carefully adjusted to secure accurate working of the dies, and to prevent shearing. Pendulum action of lever gives a stroke of maximum power without tiring operator. Workmanship and material the best.

Write me for the interesting price

**E. O. PARTRIDGE, 2041-2049 CHICAGO
W. Lake St.**

Also Bench, Column & Cabinet Grinders, Polishing Lathes, Light Punch Presses, Hollow Mills, Countershafts, Chuck Arbors and Saw Mandrels



You Can Punch More Holes With Every T. H. L. Punch

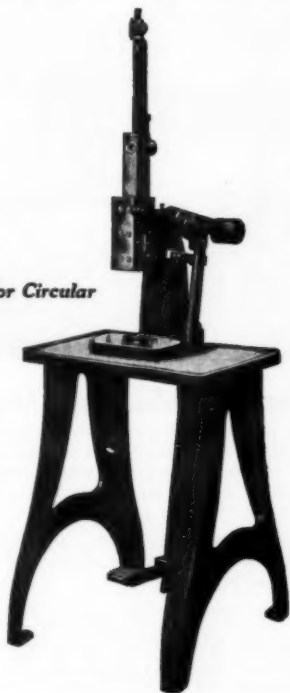
"T. H. L.'s" will punch a good deal more than the average number of holes before wearing out. This is due to the fact that we use an unusually high grade of tool steel and we harden and temper each punch individually.

*Absolutely uniform and accurate
A trial order will convince you*

T. H. Lewthwaite Machine Co.
417 East 31st St., (Est. 1890) New York City

Spring Foot Press

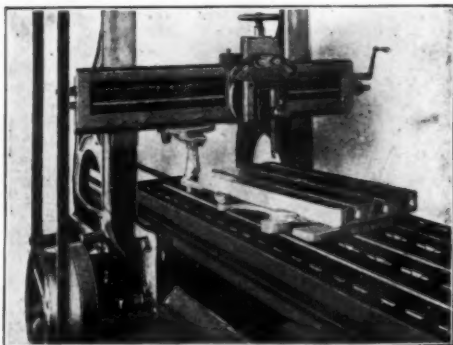
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The Taylor & Fenn Company
Hartford, Conn., U. S. A.

Makes It Easy—

To Plane Curves on Your Planer



The Underwood Radius Planer Attachment

on an ordinary planer, enables you to do absolutely accurate work on all kinds of links, blocks and circular work. If desired, we will furnish a scale for setting to any radii. The Underwood has no superior for planing curves of any radius, and perfectly parallel curves.

Portable Tools often enable you to make complete repairs in the time ordinarily needed for the disconnecting of the defective parts. Our line includes:

Millers; circular planer tools; radius planers; rotary planers; machines for truing eccentrics, facing domes, arms for facing cylinder flanges; rotary flue cleaners; pipe benders; locomotive cylinder borers; boring bars for lathe work; crank pin turners; reflex water glass grinders; and special machines built to order.

Write for the Catalog—it pays to have one handy

H. B. Underwood Corporation

1015-25 Hamilton St., Philadelphia, Pa.

Second-Hand Machinery

Lists of Second-Hand Machinery, either for sale or wanted, set in uniform style, will be published under this heading at the rate of **50 cents a line**, across the page, each issue, plus **\$2.50** for name and address. Minimum charge, **\$5.00**. No display permitted in this department.

Write directly to those offering the machines for sale for prices and full descriptions. If what you seek is not listed, use the blank enclosed to make known your wants to the publisher, who will pass them along to all Machine Tool List advertisers.

FOR SALE BY

J. L. Lucas & Son, Inc., - - - **3 Fox St., Bridgeport, Conn.**
 Boring mill, Oakland horizontal, complete and in excellent condition, \$1,250.
 Drill, 24" Blaisdell, b. g., round and square tables. 225.
 Press, DG-54 Ferracute, b. g., 2" stroke, complete. 895.

FOR SALE BY

A. A. McLaughlin & Co., **24 West Second St., Cincinnati, O.**
 Hammer, Beaudry 100 lb., belt driven. \$300.
 Lathe, Niles 24"x12", has chuck and face plate. 750.
 Lathe, Mueller 15x6" high speed. 175.
 Lathe, Fox 14"x3" screw cutting. 125.

FOR SALE BY

Tranter Manufacturing Co., **105 Water St., Pittsburgh, Pa.**
 Gear cutter, B. & S. No. 13 univ. | Lathe, turret, Bordon, g. g.
 Grinder, Blount 20", wet tool. | Lathe, Wormer 12", speed.
 Grinder, Hamilton 20", wet tool. | Lathes, Dreses & Mueller, b. g., (7).
 Hack saw, Millers Falls, 6x6. | Turret screw lathes.

FOR SALE BY

Botwinik Brothers, - - - **21 Sylvan Ave., New Haven, Conn.**
 Millers, No. 3A B. & S. heavy universal, complete, latest type.
 Millers, No. 2A B. & S. universal, complete, latest type.
 Millers, No. 2 B. & S. universal, complete, latest type.
 Millers, No. 1 Kempsmith universal, complete, latest type.
 Planers, 24"x24"x6" Gray, 2 head, latest type.

FOR SALE BY

Industrial Mchy. & Sales Co., **549 W. Washington Blvd., Chicago**
 Your chance to buy good used tools 90% new
 Air compressor, 7x6 Ingersoll-Rand, | Planer, 36"x23"x16" table, extra
 15 h. p., 220 v., a.c. motor attached | width, 2 hds., power raising and
 with belt. | lower, belt drive.
 Grinder, No. 60 Heald, cylinder. | Planer, Ohio, 24"x24"x6" table, belt
 Grinder, Mattison, cylinder. | drive, single head.
 Grinder, 24" Blanchard, vert. spdl. | Press, No. 21½ Blas, o. b. i. geared.
 surface, magnetic chuck & wheels. | Press, No. 76 Consolidated, geared.

Send us your requirements.

SECOND-HAND MACHINERY

FOR SALE BY

Niles-Bement-Pond Company, 111 Broadway, New York

Located at our various factories and stores.

LATHES.

14"x 5' Whitcomb, q. c.	28"x12' Pond, c. r.
16"x10' LeBlond standard.	32"x12' Pond, c. r.
17"x 6' & 8' LeBlond, geared head.	36"x20' Pond, 220 volt, motor, d. c.
20"x10' LeBlond, q. c.	42"x20' Niles, triple geared.
24"x10' Whitcomb, q. c.	48"x30' Niles, triple geared.
28"x10' Pond, 220 volt motor, d. c.	54"x28' American, 220 volt motor, d. c.
24"x24' Niles, c. r.	

TURRET LATHES.

No. 6-A P. & J., 220 volt motor, d. c.	2"x24" Jones & Lamson, cone head.
1", 2", and 2 1/2" P. & W.	24", 28", & 34" Gisholts.
2"x24" W. & S. hollow hex.	32" Conradson American.

PLANERS AND SHAPERS.

14" & 20" G. & E. shapers.	36"x36"x16' Pond, heavy reversing motor.
20" Stockbridge shaper.	42"x42"x14' Bement, 4 heads.
24"x24"x 6' Powell.	48"x48"x20' Bement, 4 heads.
24"x24"x 6', 8' and 10' Whitcomb.	60"x60"x14', 20' & 24' Niles.
28"x36"x 6' Gray.	72"x72"x12' Bement, 4 heads.
30"x30"x 6' & 10' Ponds, 2 heads.	72"x72"x20' heavy Ridgway, reversing motor.
30"x30"x12' Pond, reversing motor.	
36"x36"x 8' to 25' belt drives.	

MILLERS AND GEAR CUTTERS.

Nos. 1 1/2 and 2 Brown & Sharpe universal, cone type.	No. 5 Brown & Sharpe vertical, cone type.
No. 2-A Brown & Sharpe universal, all geared.	Nos. 3, 4 & 6 B. & S. gear cutters.
No. 2-B B. & S. plain, all geared.	15" Gleason bevel gear generator.
Nos. 4 & 5 B. & S. plain, cone type.	6"x48" & 90" P. & W. old style thread millers.

DRILLING MACHINES.

25", 32" and 40" sliding head drills.	4' & 6' universal radials.
3 1/4", 3", 4", 5", 6' plain radials.	12-spindle P. & W. No. 13 multiple.

GRINDERS.

No. 8 Higley saw grinder.	12"x36" Cincinnati, plain.
6"x30" Fraser universal.	12"x40" No. 3 Brown & Sharpe universal.
10"x72" Norton plain.	

BORING MACHINES.

2 1/2" Bar 4' W. & S. horizontal.	3" Bar No. 1 Lucas horizontal.
2 1/2" Bar 5' Binsse horizontal.	4 1/2", 5" & 6 1/2" Niles floor borers.
3 1/2" Bar 6' & 8' Bement horizontals.	42" and 51" Niles vertical mills.
4 1/2" Bar 8' Niles horizontal.	60" Bement vertical mill.
4 1/2" Bar 9 & 10' Bement horizontals.	10' Niles, 220 volt motor, d. c.

MISCELLANEOUS.

Air compressors, 215', 535' and 835' capacity.	Graduating machine, LeBlond.
Blowers, No. 10 Sturtevant; No. 70 Buffalo.	Hammer, 750 lbs. Sellers.
Crane, 3-ton Niles, 14' 2" span, d. c.	Hot blast apparatus, 120" fan engine, Sturtevant.
Crane, 20-ton 48' span, Sellers, d. c.	Motors, 5 to 100 h. p., d. c.
Engines, 125, 150 and 200 h. p. Philadelphia Corliss.	Pump, 500 gal. steam drive.
Generator set, 100 k. w., d. c., and engine.	Saw, 8" rounds, Higley.
	Screw shaver, No. 2 P. & W.
	Separator, oil, No. 1 American.
	Slotter, 6" Bement.

SECOND-HAND MACHINERY

FOR SALE BY

Russell Machine Co., 28th St. & A. V. R. R., Pittsburgh, Pa.

LATHES.

48"x32" N. B. P., triple geared.
 48"x28" Niles, c. r.
 48"x26" Pond, triple geared.
 28"x12" Boye & Emmes, q. c. g., d. b. g.
 26"x12" Pittsburgh, dbl. b. g.
 26"x20" Putnam, b. g., c. r.
 26"x10" Walcott, q. c. g.
 24"x16" Johnson lathe.
 19"x10" LeBlond, motor drive.
 19"x6" Bullard, c. r., h. s.
 18"x8" Mueller, q. c. g., new.
 18"x8" Sidney, q. c. g., d. b. g.
 18"x8" Rahn-Mayer-Carpenter.
 16"x6" Columbus, q. c. g., new.
 15"x8" Schellenbach, d. b. g., h. s.
 14"x6" Hendey, q. c. g.
 10"x56" Star, foot power.
 24"x6" Gisholt turret, 4" h. s.
 24"x6" Gisholt tur., 6" h. s., m. d.
 14"x5" American speed lathe.
 13"x5" Blount speed lathe.
 18"x7" Wood lathe.

PLANERS AND SHAPERS.

20"x30"x51" planer, 1 hd.
 24"x24"x8" Chandler planer, 1 head.
 48"x48"x2" Pond planer, 4 heads.
 72"x56"x12" Betts planer, 2 heads.
 24" Cincinnati b. g. shaper, m. d.
 24" Walcott geared shaper.
 24" Stockbridge shaper.

DRILLS AND BORING MILLS.

20" Champion, new, pl. w. & l.
 20" Silver, new, plain w. & l.
 24" Aurora upright, b. g.
 36" Snyder b. g. drill.
 40" New Haven, b. g. drill.
 3", 4", 6" & 7" Prentice radial drills.
 6", 7" & 8" Pond radial drills.
 9" Baush radial drill.
 No. 1 Myers 10" sensitive drills.
 10" Dwight-Slate sensitive, floor.
 14" U. S. sensitive drill.
 30" Warner-Swasey boring mill.
 36" Bridgeport boring mill.
 42" Bullard boring mill, 2 heads.
 50" Bullard boring mill, 2 heads.
 60" Niles boring mill, 2 heads.
 72" Pond boring mill, 2 heads.
 90" Niles boring mill, 2 heads.

PUNCHES, SHEARS, PRESSES AND ROLLS.

50" throat Reade sgl. end punch and shear; massive construction.
 No. 45 Buffalo punch, 1 1/2"
 No. 4 Doelger & Kirsten alligator shear, cap. 4 1/2" round soft steel.
 Garrison m. d. alligator shear, 15" knife, cap. 3" square, 36000 lbs.
 Lewis m. d. alligator shear, 24" knife, cap. 3 1/2" square, weight 50000 lbs.
 Morgan plate shear, 96"x1" thick.
 Garrison plate shear, cap. 3"x81" m. d.
 Mesta plate shear, cap. 4"x156".
 Carlin alligator shears, 2 1/2" cap.
 Schatz punch and shear, 1 1/2" throat.
 No. 56 dbl. housing knuckle press.
 Stiles Nos. 3 & 23 inc. presses.
 Bliss No. 18 o. b. i. power press.
 Bliss No. 75 s. s. press, 6" stroke.
 Bliss No. 76 s. s., d. g. press, 11" str.
 Corry Mch. Co. press, 12" stroke.
 No. 116-A Niagara press, m. d.
 Straight-side punch press, 4" str.

MILLING MACHINES.

No. 3 LeBlond plain. No. 12 Garvin plain, 18"x6"x15".

MISCELLANEOUS.

Air compressor, No. 6 Au-To 3"x4".
 Air compressor, 8"x8" hor. b. d.
 Band saw, Greaves-Klusman 36".
 Band saw, Kane-Roach 30".
 Blower, Root No. 3 Acme, hand.
 Blower, Sturtevant, No. 4, volume.
 Blowers, Buffalo Nos. 5 and 8.
 Blowers, Buffalo No. 7-8 vol.
 Boiler, 24"x5" vertical.
 Bolt cutter, Landis 1 1/2".
 Brazing table, all iron, 17"x29 1/2"x31".
 Buffer, U. S. elec. spindle 53"x1".
 Bulldozer, No. 2 Williams-White.
 Bulldozer, No. 4 Williams-White.
 Chain belt, 16"x8"x1 1/2" p. and gear.
 Cold saw, No. 17 Higley, 20" saw.
 Cold saw, Wagner, size 18 type 3.
 Cold saw, Gliem, 22" diam. 6" cap.
 Crane, 10" I-beam, 12'3" span.
 Crimping machine for short work.
 Fan, 48" ventilating.
 Forges, Nos. 41-43 Champion new.
 Grinder, Greenfield cutter & tool.
 Grinder, Diamond No. 3 wet tool.
 Grinders, Plymouth Nos. 13, 14, 17.
 Grinder, Barnes 20" wet tool.
 Hammers, 100 & 200 lb. belt power.
 Hammers, 2500 lb. Chambersburg, double leg steam forging.
 Heading, upsetting and forging machine, 3" National.
 Hoist, contractor's steam, with 8 h. p. boiler & 5 h. p. engine.
 Index centers, 12" B. & S. univ.
 Polishing stand, Diamond No. 2.
 Polishing stand, d. end, 42"x1" arbor.
 Polishing stand, Cuyahoga dbl. end.
 Roll lathe, United Engr. 26"x18".
 Ripsaw, table, 49"x30".
 Roll lathe, United Engr. 26"x18".
 Saw, North Wales, hack, 5"x5".
 Slotter, Niles 15".
 Straightening rolls, 84"x10 Cleveland.
 Wiring machines, Pextio bench.

SECOND-HAND MACHINERY

FOR SALE BY

Cyril J. Bath & Co., 1603 St. Clair Ave., N. E., Cleveland, O.
Sales Agents—Surplus Equipment of American Shlp Bldg. Co.

Good Tools—Low Prices

BAR STOCK MACHINES AND TURRET LATHES.

2" & 3" P. & W. turret lathes, power cross and long. feed. No. 1 Warner & Swasey screw mche. 21" & 24" Gisholts, 1 taper attach.

BOLT AND NUT MACHINERY.

3" Landis bolt cutter, late model. 4" Landis extra long bed, motor drive.
1" Acme, style B.

BORING MILLS.

No. 3 Defiance, horizontal table type, single pulley. 48" Gisholt, double swivel head, single pulley.
No. 31 Lucas horizontal. 51" Niles, swivel and turret heads, gear drive.
No. 32 Giddings & Lewis horizontal.
72" Sellers, 2 swivel heads.

DRILLING MACHINES.

2', 3' & 4' American plain radials. 9' Cleveland wall radial.
4' Western plain, motor drive. Henry & Wright and Sipp sens.
4' Morris plain, single pulley. 26" Barnes, sliding hd., tap attach.
5' Fosdick plain. 28" Silver, sliding head.
6' Dreses full universal. No. 2 three-spl. Allen drill press.

GRINDERS.

14x50 Norton plain. No. 2 Brown & Sharpe surface, Heald magnetic chuck.
10x72 Brown & Sharpe plain. 18" Bryant internal.
No. 3 Landis universal. 12" Bridgeport, a. c., motor drive.
No. 3 Cincinnati 12x48 universal. New Yankee drill, motor drive.
No. 2 & No. 2½ Brown & Sharpe univ.
No. 13 Brown & Sharpe univ. tool.

LATHES.

13", 14", 16" and 24" Hendey. 34"x18' Putnam, cone dr., solid spld.
Gap lathe, Rahn-Larmon, 26x52x12. 42"x28' Pittsburgh heavy duty, motor drive.
14"x 8' Champion, taper, q. c., d. b. g. 42"x20' Schumacher & Boye, q. c. g.
16"x 8' Bradford, q. c. g. 42"x32' New Haven, d. c. motor dr.
24"x14' Boye & E., cone dr., d. b. g. LeBlond universal crankshaft lathe, latest model.
32"x20' New Haven, b. g., cone drive, solid spindle.

MILLING MACHINES

Nos. 1½, 2 and 4 Cincinnati plain. No. 5-B Becker vertical.
Nos. 3, 3-A and 4-A B. & S. univ. No. 2 Brown & Sharpe vertical.
Nos. 2 and 3 Kempsmith plain. No. 12 Brown & Sharpe plain.
No. 3 Kempsmith universal. Type A Briggs, Lincoln type.
No. 3 heavy duty LeBlond universal. No. 7-H Becker, Lincoln type.
No. 3 and No. 3-B hvy. B. & S. pl.

PLANERS.

24"x24"x 6' Liberty. 48"x48"x20' Patch, 4 heads, reversing motor drive.
24"x24"x 6' Gray. 48"x12' Cleveland openside.
24"x24"x 6' J. B. Pease. 60"x60"x20' Sellers, spiral dr., 4 hds.
30"x30"x 8' Gray. 24" Cincinnati crank planer.
30"x30"x 8' Niles-B.-P., box table.
48"x48"x12' Gray, 3 heads.

PRESSES.

D-301 Ferracute, 4" stroke, 32" between housings.

PUNCHES AND PLATE WORKING TOOLS.

16' Hilles & Jones ½" plate bending rolls.
Pels universal angle, bar, plate shear and punch.
12" Southwark horizontal punch, 1½x1½.
84" No. 2 Long & Allstatter single end shear, ½".
84" No. 4 Long & Allstatter single end punch, 1½x1½.
No. 4-B Quickwork rotary shear, 60" throat, ½" plate.

RIVET MAKING MACHINE.

Acme size "A" rivet and track bolt machine, large equipment.

SECOND-HAND MACHINERY

Cyril J. Bath & Co.—Continued.

16", 20", 24" & 28" G. & E.
20" & 24" American.

10" Newton, cone drive.
18" Newton, cone drive.

Cold saw, No. 11 Higley.
Crankshaft, for No. 774 Bliss press.
Crankshaft lathe, LeBlond universal, latest model.

SHAPERS.

20" & 24" Cincinnati.

SLOTTERS.

18" Betts, cone drive.

MISCELLANEOUS.

Keyseaters, Nos. 2 & 4 Baker.
Motor, 3 h. p. Cleveland, a. c.
Motor, 10 h. p. Card, d. c.
Thread roller, No. 4 Manville.

FOR SALE BY

Herman L. Winterer,

943-53 N. Front St., Philadelphia, Pa.

LATHES.

43"x17'4" Bement-Miles.
42"x25' 6" Putnam.
42"x26' Johnson d. b. g., t. a.
42"x16' Niles.
37"x14' Johnson d. b. g., q. c. f., t. a.
32"x12' Pittsburgh, heavy duty, q. c. g.
28"x16' 6" American, q. c. g.
27"x12' Bullard.
26"x11' Wickes, q. c. g.
28"x10' Niles, q. c. g.
25"x14' Hendey, q. c. g., taper attachment, oil pan, (2).

24"x14' Porter.
21"x8' LeBlond.
20"x8'6" Walcott, d. b. g., q. c. g., (2).
20"x 8' Whitcomb Blaisdell, q. c. g.
19"x12' Flather.
19"x10' Draper, patent head.
18"x 7' Chard, d. b. g., semi q. c. g.
18"x6' to 8' lathes, (6).
17"x 6' Lodge & Shipley, q. c. g.
16" Lathes, (10).
14" Lathes, (19).
And many others.

TURRET LATHES.

43"x 6' Lodge & Shipley chucking.
28" Pond, triangle.
3x36" Pratt & Whitney hollow hex.
19"x7' Fay & Scott.

No. 224 Garvin Monitor.
No. 3 Hardons & Oliver, back grd.
14"x4' Warner & Swasey.

DRILL PRESSES.

5' Bickford radial.
5' Prentice radial.
42" Economy radial.
40" Barnes horizontal radials, (2).
36" Bickford radial, circular base, motor driven.
18" 4-spindle 2-housing, Foote-Burt.
14" 6-spindle Allen sensitive.

14" 4-spindle Allen sensitive.
40" Lodge & Davis, b. g., sliding hd.
20" Barnes, geared head.
20" Hoosier, new, (3).
20" Champion, new, (6).
12" Allen, bench.
Plain drills, all sizes.
Drill presses, assorted sizes.

MILLING MACHINES.

38"x6' Ingersoll horizontal slab.
No. 5 Cincinnati, table 9'x50".
No. 15 Garvin, table 12x42".
No. 3 Becker Brainerd, table 12x40".
No. 3 Cincinnati, table 12'x47".

Whitney hand miller.
No. 27 Industrial Works, Lincoln type, table, 7x27".
Gooley & Edlund, 7'x46" table.

PLANERS AND SHAPERS.

48"x48"x16' Pond planer, 3 heads.
30"x30"x8' Putnam planer.
26"x28"x 6' Hendey planer.
48" Morton draw-cut shaper.

39" Pedrick & Ayer, open side.
30" Cincinnati.
16" Gould & Eberhardt shaper.
14" Warren shaper.

MISCELLANEOUS.

Bolt machine, 4" National.
Boring mill, 100" Sellers, vert. dbl. hd.
Boring mill, car wheel, 60" Newton.
Boring, drilling and milling machine, 17' Bement Niles horizontal.
Grinder, 13'x5' Landis universal.
Grinder, disc, No. 17 Besly.
Grinder, disc, No. 1 Besly.
Hammers, 60 lb. Bellefonte upright; 2.
Keyseaters, 15" stroke Morton, (2).

Keyseater, Mitts & Merrill No. 5.
Keyseater, Mitts & Merrill No. 2.
Punch presses, all sizes, (105).
Punch & shear, Industrial Wks. d. e., capacity 4" in 4", squaring 4"x6".
Slotter, Newton, 20"; cir. table.
Slotter, Newton, 18"; cir. table.
Slotter, Bement 10"; cir. table.
Tooth rounding machine, Schuchardt & Schutte.

Large assortment of General Machinery. Send for Complete List.

SECOND-HAND MACHINERY

FOR SALE BY

The Canton Machine Shop Company,

Canton, Ohio

Lathe, 13"x 5' Pratt & Whitney, t. a.
Lathe, 14"x10' Bradford.
Lathe, 16"x 8' South Bend.
Lathe, 14"x 8' Carroll-Jamieson, t. a.
Lathe, 24"x10' New Haven.
Lathe, 12"x 5' speed lathe, collets
and compound rest.
Metal shingle edging machines, (3).
Miller, No. 2 LeBlond universal.
Miller, Brainerd.
Motor, electric, 5 h. p., d c

Paper cutting knife, 5"x36".
Planer, 26"x26"x6'.
Planer, 48"x48x10' Niles-B.-P., 2 hds.
Planer, 32"x32"x10' New Haven, 2 hds.
Punch press, Bliss.
Punch presses, No. 46 Bliss, weight
25,000 lbs., (6).
Radial drill, 3' Fostick.
Shaper, 16".
Wire straightener.
25 Small grinder heads.

FOR SALE BY

A. M. Stoehr Machinery Co., 844-846 North Wells St., Chicago, Ill.

Only Used Machinery of the Better Class.

Butt welders, No. 6, No. 9 No. 10A6
and No. 10A7 Thompson
Cold saw, No. 5 1/2 Nutter Harnes.
Compressors, steam & belt drive.
Drill press, 20" Champion, b. g., p. f.
Drill press, 36" Cin'ti, b. g., sl. hd.
Drying machines, no dust.
Gear hobber, No. 3 Barber-Colman.
Grinder, No. 10 Besly, disc.
Grinder, 48" Yates, knife
Lathe, 16"x8' American, q. c. g.
Lathe, 18"x8' Advance, q. c. g.
Lathes, 50 other sizes and makes.
Milling machines, Wisconsin hand,
No. 3 1/2 Fox, No. 25 Becker.

Oil extractor, 26" Troy bot disc
Pipe mch., 6" Jarecki, motor drive.
Press, No. 92 1/2 E Toledo, dbl crank
Press, 500 ton hyd straightening
Punch press, No. 3 L. & J., o. b. i.
Screw machine, No. 1 1/2 P. & W.,
13/16" capacity.
Shear, power square, 66" No. 316
Bliss, 18" gauge.
Shear, power square, 96" No. 196
Niagara, 18 gauge.
Shear, bar, New Doty, 3x 1/4" cap, pwr.
Shear, pwr. spli'g., Niagara, 1/16 ga.
Shear, rotary, Niagara, 10 gauge.
Tapping mch., Tuttle, 1" cap.

We have other machinery, send in your list.

FOR SALE BY

E. L. Essley Machinery Co., 551-557 Washington Blvd., Chicago, Ill.

DRILL PRESSES.

24" No. 25 Foote-Burt hvy. duty.
4 sp. Allen high speed b. b. drill.

32" W. F. & John Barnes, sl. head.
24" Fostick plain radial.

LATHES.

18"x8' Whitcomb Blaisdell, q. c. g.
18"x10' Prentice, q. c. g.
20"x14' Putnam.

21"x8' Cisco, q. c. g., d. b. g.
21"x10' South Bend.
30"x14' Niles.

MISCELLANEOUS.

Boring mill, 60" Bullard vertical.
Gear cutter, No. 3 B. & S. auto.
Grinder, 12"x24" Modern plain.
Grinder, No. 1 Sellers, pat. tool.
Grinder, No. 16, 18"x72" B. & S.
plain cylinder.
Grinder, 12x48" Cincinnati, cyl.
Grinder, P. & W. vertical surface.
Grinders, No. 10 Besly 18" dbl. disc, (3).
Hammer, 800 lb. W.W., board drop.
Hammer, steam, 800 lb. Massillon.
Miller, No. 33 Kempsmith prod. type
Miller, No. 2 Milwaukee universal.
Miller, No. 3 Burr, keyseat, routing
attachment.
Planer, 36"x36"x8' Betts.
Planer, 36"x36"x12' Rockford, new.

Planer, 36"x36"x12' Woodward
Powell.
Planer, 62"x56"x26" Gray, 2 heads.
Punch pr., No. 4 & 4 1/2 Niagara, o. b. i.
Punch press, No. 1 Toledo, o. b. i.
Punch pr., No. 57 Toledo, st. sd., gd.
Punch press, No. 76 Toledo, o. b.
Punch pr., No. 5 Toledo pl., o. b. i.
Punch pr., No. 74 1/2 Bliss, st. sd., gd.
Punch pr., No. 61 Bliss, o. b., reduc.
Saw, Smith & Post cold saw.
Screw machine, No. 0 B. & S. semi-
auto, hand.
Screw mch., 2"x2 1/4" Cleveland auto.
Shear, No. 252 Niagara, power.
Shear, 72" Loy & N., pwr., 1" cap.
Turret lathe, No. 3 Pratt & W.

SECOND-HAND MACHINERY

FOR SALE BY

Jones Machine Tool Co.,

Drill, 4' Fosdick radial.....	\$ 600.
Drill press, 24" Barnes.....	200.
Drill press, 21" Superior.....	110.
Grinder, No. 23 B. & S., cyl.....	900.
Grinder, No. 60 Heald, cyl.....	1300.
Lathe, 14"x 6' Whitcomb, q. c.....	400.
Lathe, 16"x 6' Springfield.....	325.
Lathe, 18"x 6' American, q. c.....	495.
Lathe, 21"x10' LeBlond, q. c.....	900.
Lathe, 24"x16 S. & B., l. c.....	800.
Lathe, 26"x12' Advance, q. c.....	975.
Lathe, 36"x10' L. & D., l. c.....	875.

435 E. Pearl St., Cincinnati, Ohio

Miller, No. 2 Cinti plain.....	\$ 575.
Miller, No. 3 Cinti plain.....	800.
Miller, No. 4 Cinti plain.....	1200.
Miller, No. 3 K. & T. plain.....	900.
Miller, No. 3 B. & S. plain.....	900.
Planer, 32"x10', 2 heads.....	1100.
Press, Bliss No. 20 o. b. l.....	400.
Press, C54 Ferracute, horning.....	400.
Press, No. 744 Bliss s. s., 4" str.....	875.
Screw mche., 14" Dresses, hand.....	200.
Shaper, 24" Cinti crank.....	900.
Shaper, 16" Smith & Mills.....	385.

Send for our complete Stock List

FOR SALE BY

A. D. White Machinery Co.,

108-114 N. Jefferson St., Chicago

ENGINE LATHES

14"x 6' Smurr & Kamen.
18"x 7' Chard, d. b. g., p. c.
18"x 9' Bell, d. b. g., p. c.
20"x 8' Hamilton, d. b. g., s. q. c.
20"x 8' Lodge & Shipley, grd. hd.
20"x 8' Reed, s. b. g., p. c.

20"x 8' Reed motor driven.
22"x10' Davis, d. b. g., q. c.
32"x10' Pond, s. b. g., p. c.
34"x10' Putnam, s. p. g., p. c.
38"x14' Fifield, s. b. g., p. c.

MILLING MACHINES.

No. 0 Rockford, plain.
No. 25 Becker, horizontal.
No. 1 Newton slab.

Model AB Becker, vert., motor dr.
Type "A" Briggs (3).

DRILL PRESSES.

20" Mechanics, friction.
26" Barnes, sliding head.
28" Barnes, sliding head.
36" Aurora, sliding head.

2 spindle Guarantee, h. s., b. b.
4 spindle Reed sensitive, 1/2" cap.
24" No. 24 Foote-Burt heavy duty.
2 spindle 24" Barnes, all grd. gang.

PUNCH PRESSES.

No. 0 American Can.
No. 8 & No. 11 Bliss auto. button presses.

19" throat geared punch.
New Swaine o. b. i. presses Nos. 27, 29, 31, 33, 35 and 37.

TURRET LATHES AND

No. 3 Foster, plain head.
20"x5' Bridgeport. (2).
20"x8' Fay & Scott universal.
22"x5' Reed.
21" and 24" Gisholts.
3x36" Jones & Lamson.
14"x16" Milholland.
14" Biggs (2).
No. 1 Garvin, hand. (4).
No. 1 B. & S. auto. 1/2" (2).

SCREW MACHINES.

No. 3 Stecher, hand. (4).
16"x5' Dresses Fox.
18"x6' American Fox.
18"x6' Springfield Fox.
7/16" Cleveland, ratchet feed.
1/2" Cleveland, semi-auto.
1/2" Cleveland, friction.
1/2" Cleveland, jigger.
1/2" Hartford. (2).
1" Cleveland, jigger.

BOLT CUTTERS AND

14" Acme, double head.
24" Acme single head. (2).
4" Acme single head.

PIPE MACHINES.

4" Saunders (2).
8" Eaton, Cole & Burnham.

MISCELLANEOUS.

Blower, No. 7 Sturtevant, high press.
Boring mch., 2 1/2" bar, Binsse horiz.
Gang splitter, takes 21" sheets.
Gang splitter, takes 29 1/2" sheet.
Gas engine, 35 h. p. Columbus.
Gas engine, 55 h. p. Bruce-McBeth.
Grinders, No. 2 Woods tool & cutter
Grinder, No. 2 Oesterlein tool & cut.
Grinder, 10x30 Landis plain.

Grinder, Springfield, 2-wheel wet.
Grinder, Leland & F., wet.
Planer, 30"x30"x10' Pond, 1 head.
Profiler, 2 spindle Putnam.
Riveter, 1/2" Shuster.
Saw, No. 54 Nutter-Barnes.
Screw slotter, Garvin hor. 3/16 to 1/2".
Tapper, No. 2 Garvin, auto.

SECOND-HAND MACHINERY.

FOR SALE BY

The Sebastian Lathe Company, - - - Cincinnati, Ohio

SEBASTIAN LATHES

These lathes have all been used in our own shop.

15" x 6' plain rest, cone head.....	\$ 275.
15" x 6' compound rest, cone head.....	325.
15" x 8' gap bridge, cone head, compound rest, used 30 days.....	450.
15" x 8' compound rest, almost new.....	375.
15" x 4 1/2' compound rest, almost new.....	350.

These are cash prices f. o. b. cars Cincinnati

FOR SALE BY

Federal Machinery Sales Company,

8 N. Jefferson St., Chicago, Ill. 218 Sycamore St., Milwaukee, Wis.

Used Tools—Special Bargains

Drill, radial, 3 1/2' Western plain, slightly used.
 Drills, multiple spindle, new No. 12 Natco, (2), each with 10 spindles.
 Furnace, gas oven, No. 9 Stewart.
 Gear generator, 14" Lees-Bradner.
 Grinder, plain, 6" x 32" Norton.
 Lathe, 17" x 6' Greaves-Klusman, with d. c. motor.
 Miller, duplex, No. 3 Van Norman, new.
 Planer, 26" x 26" x 8' Whitcomb-Blaisdell, two heads.
 Screw machine, 1 1/2" No. 1 Southworth.
 Screw machine, 1 1/2" x 10" Millholland, new.

FOR SALE BY

W. P. Little Co.,

1616 Columbus Road, Cleveland, Ohio

LATHES.

13" x 6' Prentiss, p. r., t. a.	20" x 10' Rahn-Mayer, c. r.
14" x 6' Blaisdell, c. r.	20" x 10' Lodge & Davis, p. r.
14" x 6' LeBlond, c. r.	24" x 15' New Haven, c. r., t. a.
14" x 6' Plain rest.	26" x 9' Bridgeford, q. c. g., (2).
16" x 6' LeBlond, gap, c. r.	30" x 10' Plain turning.

SHAPERS.

16" Barker, b. g.	18" Juengst, friction.
16" Walcott, crank.	20" Kelly, b. g. crank.

DRILLS.

20" Hoefer, b. g., p. f.	24" Heavy duty.
20" Prentice, w. & l.	No. 1 Avey.
24" Aurora, b. g., p. f., s. h.	3-spindle Fox.
28" Aurora, b. g., p. f., s. h.	2-spindle Reed.
3-spindle Barnes, 20".	4-spindle Fox, (4).

MILLING MACHINES.

U. S. hand millers, (3).	No. 4 Hendey Lincoln.
No. 1 Brown & Sharpe universal.	Reed, Lincoln pattern.

GRINDERS.

6" x 32" Norton plain.	No. 23 Brown & Sharpe cylinder.
Washburn drill grinder.	No. 3 B. & S. cutter and reamer.

PUNCH PRESSES.

No. 19 Bliss dial press.	18" throat Excelsior, 1/2" cap.
No. 1 Toledo, o. b. i., (4).	No. 19 Bliss horizontal dial.
No. 65 Consolidated g., s. a.	No. 87 Z. & H. presses, (2).

MISCELLANEOUS.

Band saw, 36".	Slotter, 8".
Broach, No. 3-A LaPointe.	Spline miller, 4" P. & W.
Furnace No. 3 Frankfort.	Tapping machine, No. 1 Garvin.
Screw machine, No. 4 B. & O.	Turret, 16" W. & S.

We buy Used Machinery. What have you to sell?

SECOND-HAND MACHINERY

FOR SALE BY

Walther Machinery Co., 629 Main St., Cincinnati, Ohio
Automatics, Nos. OOG and OG Brown & Sharpe, with slotting attachments and regular equipment, new.
Drill press, D-3 Colburn heavy duty, used.
Drill, 8-spindle multiple, No. 4 Morse, used.
Grinder, 8"x18" Ott plain, used.
Turret machines, Steidle, without side carriage, rebuilt, (9).

FOR SALE BY

The Enterprise Machinery Co.,

Boring mill, 48" vertical..... \$ 700.
Boring mill, 36" Niles, 2 hds... 1300.
Drill, 24" Barnes, b.g., p.f., hvy. 150.
Grinder, Heald No. 60..... 1400.
Grinder, disc, 30", and cup... 200.
Grinder, Landis No. 11..... 450.
Grinder, knife, auto., 36" cup wheel..... 175.
Grinder, Blake & J. surface... 75.
Keyseater, Baker No. 00..... 150.
Lathe, 28"x14" Rahn-Carp., heavy chuck, fine condition.. 950.

28 S. Clinton St., Chicago

Lathe, 16"x6' Am. q. c., taper \$ 375.
Miller, Cin. No. 1 univ., div. hd. 500.
Punch press, No. 2 Consol.... 240.
Punch press, bench, roller fd.. 160.
Punch, sh. & rod c. 1"x4", \$250-350.
Radial, Bickford, 3..... 500.
Radial, Am. 4' high spd., 90% 550.
Roll, 20' Wickes, 11/16 drop end 4200.
Screw machines, Foster No. 1, \$290; No. 2..... 345.
Screw machines, Foster No. 3. 350.
500 other tools. Write us.

FOR SALE BY

Frank H. Parker Company, First Nat'l Bank Bldg., Chicago, Ill.

Air compressor, 8"x12" double vertical..... \$ 500.
Air receiver, 4'x10', new... 250.
Bending roll, 8', with 4" rollers 450.
Boring mill, Binsse, 3" bar... 1800.
Boring mill, car wheel, 48".... 800.
Boring mill, 40" Niles horiz... 7500.
Brake, 8" for No. 8 gauge..... 1200.
Bucket, 4 yd. orange peel..... 500.
Bulldozer, No. 4 W. & W..... 1200.
Crane, 2 ton, hand traveler..... 150.
Derrick, 10 t., stiff leg, 40' broom 800.
Drill press, 24" back geared... 150.
Drill, radial, 3' Gang..... 800.
Engine, oil, 15 h. p., F. M..... 150.
Grinder, 30" swing, 22" centers 500.
Grinder, No. 60 Heald cylinder 1700.
Hammer, 600 lbs. steam..... 700.
Hoist, 5 ton Y. & T. triplex... 150.
Lathe, 6"x48" Barnes..... 150.
Lathe, 14"x 8' q. c. g., a..... 450.
Lathe, Gisholt turret 21"..... 600.
Lathe, 28"x12" Walcott, q. c. g. 1000.
Lathe, 20"x12", c. r., t. a..... 700.
Lathe, 28"x10" Niles, d. b. g... 800.
Lathe, 28"x16" Ffield, c. r., s. s. 500.
Lathe, 60"x30" Niles, fair..... 1600.
Lathe, pulley, 24" Streit..... 600.
Lathe, pulley, 36" Streit..... 1100.
Lathe, Marvel, 4"x48" L. & S. 1200.
Milling mche., No. 0 Cin. plain 300.
Milling machine, No. 3 Brown & Sharpe univ..... 1700.
Milling mche., No. 2 Cin. pl... 800.
Milling mche., No. 4 Cin. pl... 1200.

Milling mche., No. 5 B. & S. pl. \$1500.
Milling mche., Burke hand... 140.
Motor, 50 h. p., a. c., G. E., 440 v. 450.
Planer, 30"x30"x10', 1 head... 400.
Planer, 24"x24"x5', 1 head... 700.
Press, arbor, 50 ton..... 125.
Press, double crank, 50 ton... 800.
Press, No. 202-B Toledo, 5, g. 900.
Press, No. 2 Consolidated, o. b. l. 300.
Press, No. 924-E Toledo..... 2700.
Press, 7' bet. housings, dbl. cr. 4000.
Punch, 30" throat, 14" in 14" 2000.
Screw mche., B. & S. No. 2, hand 600.
Shaper, 12" crank, complete... 200.
Shaper, 20" crank, Smith..... 500.
Shaper, 28" crank, G. & E. fair 700.
Shear, 10' for 3/16", with 16" gap 2000.
Shear, 50", for No. 11 gauge & 15" gap..... 700.
Shear, Cleveland, with 15" knife 800.
Shear, Lennox, 4", bevel..... 700.
Slotter, 24" Sellers..... 1100.
Sprue cutter for foundry..... 90.
Steel, 14"x1"x18" New Mild, 3c per lb.
Steel, tool, 3" up to 10", all new, 10c per lb.
Tumbling barrel, 26x36x72..... 400.
Welder, spot, 15 k. w., Winfield 500.
Lot of brand new Government surplus cars, axles, bolts, dies, cutters, drills, reamers, lathe bits, collets, chucks, bearings, counter-shafts, belts, gears, furnaces, sprockets, etc., etc. etc.

SECOND-HAND MACHINERY

FOR SALE BY

Machineshop Equipment Corp'n, - 170 Oliver St., Boston, Mass.

Extension gap lathe, 36"x8'.
Milling machines, Briggs type A, in A1 condition (4), at \$245 each.
Planer, 24"x24"x6' second belt Whitcomb, A1, \$1,000 if taken at once.
Also 100 other machine tools at very low prices.

WANTED TO BUY

We want a 22" or 24" planer with 10' or 12' bed.

FOR SALE BY

Wayne Machinery Co., Fort Wayne, Ind.

Branches: 18 W. 2nd St., Dayton O. 121 S. 3rd St., Louisville, Ky.

Our Guaranty: Money back if not satisfied.

PRESSES AND PUNCHES.

No. 2 Pratt & Whitney.	Doty comb. p. & s., geared, about
Willard inc., Nos. 2 to 6. (6).	4x1", 7" throat.
No. 4 Long & Allstatter, double end.	52" Bertsch multiple punch.

SHEARS.

96" Niagara squaring, 18 ga.	Toledo No. 361 rotary.
9" Bertsch squaring, 1/2" cap.	No. 6 Quickwork, 48" thrt., 1" cap.
37" Bertsch squaring, 14 ga. cap.	

MISCELLANEOUS.

Air compressor, 8x8 Ingersoll-Rand, class ER.	Keyseat miller, No. 2 Newton.
Bolt cutters, National, 1" cap., (2).	Pipe mch., No. 1 Williams, 2" cap. motor drive.
Cold saw, No. 18 Lea Simplex.	Pipe & bolt mch., Wiley & R., 2" cap.
Gear cutter, No. 3 Brown & Sharpe.	Riveters, Grant, 3/16" cap., (3).
Keyseater, Davis.	Welder, butt, No. 6-A Toledo.
Keyseat miller, No. 1 Newton.	Welder, tire, No. 3 Long & A.

See also our large list on other page.

FOR SALE BY

Frank Toomey, Inc.,

127-131 N. Third St., Philadelphia, Pa.

LATHES.

42" Pond car wheel, motor drive.	17"x 8' Sidney, d. b. g., q. c., new.
36"x16' Sidney, d. b. g., q. c., new.	16"x 8' Monarch, d. b. g., q. c., used.
25"x14' Sidney, d. b. g., q. c., new.	15"x 6' Sidney, d. b. g., q. c., new.
19"x 8' Sidney, d. b. g., q. c., new.	13"x 5' 6" Carroll, s. b. g., p. c., new.

SHAPERS AND PLANERS.

24" Potter & J. crank shaper, used.	36"x36"x10' Cin'ti. planer, 3 hds., mtr.
16" Hendey shaper, back drive, used.	24"x24"x8' Hendey planer, 1 head.
14" 16" 20" 24" Steptoe shapers, new.	24"x24"x6' Pease planer, 1 head.
7" Rhodes precision shaper, new.	16"x16"x42" Walter planer, 1 head.

MILLERS.

No. 22 Garvin, vertical, used.	No. 2 Putnam, universal, used.
No. 4 Brown & Sharpe, plain, used.	No. 1 Dow, plain, new.
No. 4 LeBlond, plain, used.	No. 0 Steptoe, plain, b. g., new.

DRILLING MACHINES.

48" American, pl. rad., sp. box, used.	21" Superior, b. g., p. f., new.
36" Hamilton, pl. rad., cone dr., used.	20" Buffalo and Champion, b. g.
32" Superior, s. h., b. g., p. f., new.	16" Canedy-Otto hi-speed, used.
28" Superior, s. h., b. g., p. f., new.	4-spindle Superior hi-speed, used.

MISCELLANEOUS.

Bolt cutter, Greenfield, 1 1/2" and 2", new.	Hammer, st., 1500 lb. Bement, s. leg.
Boring mill, 42" Bullard, vertical.	Keyseaters, Nos. 2 & 4 Catlin, used.
Boring mill, 3" bar, Binsse, hor.	Pipe machines, 2", 4", 6" Oster, new.
Grinder, 10"x36" Norton, plain, used.	Pipe machine, 8" Loew, used.
Grinder, No. 1 Fraser, univ., new.	Press, hyd., Watson & S., 30 tons.
Hack saws, 6x6 & 9x9 Peerless, new.	Slotter, 10"-12" Dill, used.

SECOND-HAND MACHINERY

FOR SALE BY

J. Bleser Manufacturing Co.,

Adding mche., 9-column Burroughs.
Chain hoists, Wright 3-ton h. s., new.
Cranes, Whiting overhead, hand pwr.
Crucibles, Nos. 60 and 70, new.
Crucible furnaces, Fisher, fuel oil.
Drills, 20" Barnes and Excelsior.
Drill, bench, with motor, new, \$50.

Springfield, Ill.

Drills, 34" and 24" Barnes, sliding hd.
Lathe, 17" LeBlond, rapid pwr., q. c.
Lathe, 20" x 8' Monarch, q. c.
Millers, hand, No. 3 Burke.
Oil tank, 8' dia. x 27' long, 9000 gal.
Sand riddle, Champion, and motor.
Snap flasks, Arcade 10x16x4Cx3D.

FOR SALE BY

The Strong, Carlisle & Hammond Co., Cleveland, O., Detroit, Mich.

ENGINE LATHES.

16" x 8' Lodge & Shipley, compound
rest, patent head.
16" x 6' Hamilton.
17" x 8' LeBlond, 3-st. cone, hvy. duty.

24" x 14' Boye & Emmes, c. r., 3-step
cone.
24" x 22' Union Machine Co., c. r.

TURRET LATHES AND SCREW MACHINES.

1" Millholland, plain head.
24" x 10" Millholland, g. f. h., p. f.
14" Garvin, g. f. h., p. f.
14" Lodge & Davis, plain head.
24" Davis turret boring and chuck-
ing lathe, with forming rest.
22" Lodge & Shipley heavy duty
turret boring lathe.
14" Acme screw mche., p. f. to tur., (3).
26" Gisholt heavy duty turret lathe.

No. 2-A Warner & Swasey g. h.
turret lathes, (2).
No. 3-A Warner & Swasey g. h.
turret lathe, (2).
2" x 24" Jones & Lamson g. h. flat
turret lathe.
No. 00 Brown & Sharpe auto., (8).
No. 0 Brown & Sharpe auto., (7).
No. 2 Brown & Sharpe auto., (3).
1 to 1" Model A Cleveland auto.

DRILLING MACHINES.

Single spdl. upright sensitive, (2).
24" Baker, hvy. duty, sta. head.

4 spindle Foote-Burt, adjustable
head.

MILLING MACHINES.

Bench miller on column, with c. s.
No. 1 U. S. hand, 3-st. cone., c. s.
No. 15 Garvin plain, b. g.
No. 22 Garvin, vertical spindle.
No. 1 Cincinnati plain.

No. 3 Brown & Sharpe, plain, taper
nose.
No. 6 Becker, vert., rotating table.
12" Pratt & Whitney, horiz., auto.
No. 3 Burke, bench type, hand.

GRINDERS.

No. 10 Cochrane-Bly auto. bench
saw filing machine.
12" x 66" No. 4 Landis univ., complete.
No. 1 Brown & Sharpe, univ.
Type "DE" Hisey-Wolf internal.

Gisholt tool grinder.
No. 14-16 Besly, wet ring wheel.
6" x 18" Landis, plain, single pulley
drive.

HAMMERS AND RIVETERS.

No. 3 High speed riveting hammer.
Coffman post pwr. dr. hammer 25 lbs.
Cady belt drop hammer, 100 lbs.

11 1/2" thr. Grant rivet spinning mche.
No. 203 Grant rivet spinning mche.

METAL CUTTING TOOLS & SQUARING SHEARS.

Excelsior power hack saw.
12" Burke metal cold saw.

Higley cold saw.
No. 15 1/2 Higley cold saw.

PUNCH PRESSES.

No. 11 Badger, hand.

GEAR CUTTERS.

26" No. 3 Brown & Sharpe auto., (2).
60" Eberhardt, spur.

No. 13 Brown & Sharpe auto., (2).

MISCELLANEOUS.

Boring mche., 23" swing, Star horiz.
Boring mill, 34" Colburn.
Brake, 36" P. S. & W. cornice brake,
20 gauge capacity.
Crane and hoist, Canton No. 3.
Planers 22" x 22" x 5' Putnam, 1 hd., (3).
Polishing lathes, City Machine Co.

Press, No. 65-A Consol., s. s., grd.
Press, D-301 Ferracute redrawing
and trimming.
Radial drill, 3" Gang, speed box.
Tapper, 1" Burke, bench.
Tappers, 1" Rickert-S. horizontal.

SECOND-HAND MACHINERY

FOR SALE BY

The O'Brien Machinery Co.,

Bending rolls, 8", 8" and 6" diam.
Bolt cutter, 4" Acme, single head.
Bolt cutter, 1" Acme.
Bolt cutter, 3" Acme, single head.
Boring mill, 32" Rogers, turret hd.
Drill, 3" spindle Baker Bros. heavy duty upright.
Drill, Allen 5-spindle, high speed.
Drill, Allen 6-spindle, high speed.
Drills, Moline heavy duty hog, (2).
Drill, radial, 4" Niles.
Gear cutter, 36" Whiton.
Gear cutter, 36" Gould & Eberhardt automatic.
Hammer, 500 lb. Beaudry.
Hammer, 800 lbs. Bement-Miles, double frame steam.
Hammer, 1200 lbs. Bement-Miles, double frame steam.
Hammer, 2,000 lb. United Engine Co. board drop.
Lathe, 8"x108" Fitchburg Lo-Swing.
Lathe, 16"x7" Pratt & Whitney.
Lathe, 16"x9" Lehman.
Lathe, 20"x9" Lehman.
Lathe, 20"x10" Boye & Emmes.
Lathe, 20"x14" Powell.
Lathe, 23"x12" Blaisdell.
Lathe, 24"x14" Niles.

119 N. Third St., Philadelphia, Pa.

Lathe, 30"x21" Putnam.
Lathe, 48"x16" Sellers.
Lathe, 65"x18" Bement.
Miller, No. 1 Garvin universal.
Miller, No. 3 Hendey plain.
Miller, No. 34 Fox.
Miller, No. 3 Becker vertical.
Pipe machine, 4" Oster.
Pipe machine, 2" Cox, heavy duty.
Pipe machine, 2" Oster.
Pipe machine, 6" Oster.
Pipe machine, 8" Curtis & Curtis.
Planer, 32"x30"x10" Niles, milling head as well as planer head.
Planer, 42"x46"x9" Pond.
Planer, 50"x50"x18" Betts.
Presses, approximately 50, assorted sizes, Waterbury-Farrell Foundry, weights approx. 2,000 to 5,000 lbs.
Presses, Toledo No. 83 straight sided power, 24" stroke, (7).
Press, No. 47 Niagara, deep throat.
Shaper, 16" Hollingworth, back grd.
Shaper, 18" Hollingworth.
Shapers, 2-12" & 2-15" Spring'd.
Shapers, 12", 20" and 24" Juengst.
Slotter, 12" stroke Bement.
Turret lathe, No. 64 Bardon & Oliver, wire feed, cabinet base.

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1001-3-5 N. Sixth St.,

St. Louis, Mo.

LATHES.

18"x 8" Lodge & Shipley.
20"x 8" Lodge & Shipley.
19"x10" Springfield.
24"x12" Schumacher & Boye.
24"x14" Schumacher & Boye.

25"x16" Niles.
27"x18" Springfield.
33"x20" Draper.
54"x16" Putnam.

SHAPERS.

20" Gould & Eberhardt.
24" Gould & Eberhardt.

20" Wetherell, traveling head.

PLANERS.

24"x24"x 6" Liberty.
40"x36"x 8" Powell.

40"x40"x12" New Haven.

MILLERS.

No. 2 Rockford universal.
No. 9 Kempamith plain.
No. 2 Brown & Sharpe universal.

No. 12 Kempamith plain.
No. 3 Becker plain.
Owen duplex.

DRILLING MACHINES.

40" New Haven.
24" Foote-Burt.
16" Kern, high speed.

6" arm Prentice radial.
24" Aurora.
22" Barnes.

MISCELLANEOUS.

Boring and drilling machine, horiz., No. 2 Pawling & Harnischfeger.
Cold saw, 28" Q. & C.
Engine, Corliss, 12"x30", left hand.
Gear shaper, 36" Fellows.
Grinder, No. 60 Heald.
Grinder, 5"x15" Ott plain.

Grinder, 8"x30" Modern plain.
Hammer, 1100 lb. Morgan, steam.
Marking machine, Mathews.
Screw machines, 14" Foster.
Slotter, 6" Sellers.
Turret, 16" Bardons & Oliver, univ.
Turret, No. 4 Wood.

SECOND-HAND MACHINERY

FOR SALE BY

Brownell Machinery Co.,

Boring mill, No. 32 Lucas, motor dr.
Boring mill, No. 1 Beaman & Smith.
Drill, 3-spindle Reed Prentice.
Drill, 28" Hoefler.
Drill, 1-spindle Allen, b. b.
Drill, 26" H. & W. radial.
Drill, 4" Fosdick radial, gear box.
Drill, 6" American radial, s. p. d.
Gear generator, 11" Gleason, bevel.
Gear shaper, No. 612 Fellows.
Grinder, 10" x 50" Norton plain.
Grinder, No. 6 Bryant chucking.
Lathe, 20" x 8' Whitcomb-Blaisdell.
Lathe, 21" x 10' Roulsted.

11-13 Eddy St., Providence, R. I.

Miller, No. 1 Garvin universal.
Miller, No. 1-B Milwaukee univ.
Miller, No. 3-B Becker plain horizontal.
Miller, Griggs type A mfg.
Miller, No. 3 Becker vertical.
Planer, 17" x 17" x 4' Whitcomb-B.
Planer, 22" x 22" x 5' Whitcomb-B.
Planer, 24" x 24" x 6' Whitcomb-B.
Planer, 30" x 30" x 8' Whitcomb-B.
Planer, 42" x 42" x 18' W. & P., 4 head.
Planer, 60" x 60" x 12' W. & P., 4 head.
Shaft straightener, Rockford.
Shaper, 8" Boynton & Plummer.

HOW

—can our advertisers know that your inquiry comes from Hitchcock's List unless you tell them? When writing them, won't you kindly say that you saw it in Hitchcock's? That will be sufficient.

Second-Hand Machinery

BORING MILLS.

Four 24" Bullard vertical turret lathes, 4-jaw chuck, latest type.
Four 30" Bullard vertical boring mills, 3-jaw chuck.
30" Colburn vertical, belt feed, 3-jaw chuck.
50" Baush vertical, two swivel heads, plain table.
Binsse horizontal, 4" bar.
No. 1 Pawling & Harnischfeger horizontal.

DRILLING MACHINES.

Four No. 117 Moline heavy single spindle "Hole Hog."
No. 310 Baker Bros. high speed heavy duty, with compound table.
30" Wm. E. Gang plain radial, swinging table.

GRINDERS.

No. 17 Besly disc, NEW.
No. 70 Heald internal.

No. 16 Blanchard vertical surface, floor motor drive.

MILLING MACHINES.

Five Cincinnati semi-automatics, old style.

No. 4 Hendey, Lincoln pattern.
No. 2 Rockford plain.

PLANERS.

60" x 60" x 12' Gleason, 3 heads.

66" x 66" x 17' Harrisburg, 2 hds.

PRESSES, PUNCHES AND SHEARS.

Three Swaine No. 27 inclinable presses, NEW.
No. 8 Cleveland inclinable press, NEW.
No. 2 Thomas open back inclinable.
Single end motor driven punch and shear, cap. 4x4 or shear 4x4.

Marshall & Huschart Machinery Co.

17 S. Jefferson St., Chicago, Ill.

Now Is The Time To Fill Gaps In Your Equipment

*OUR LIST OF
USED AND REBUILT*

Lathes
Drilling Machines
Shapers
Milling Machines
Boring Mills
Broaching Machines
Gear Cutters
Grinders
Planers
Etc., Etc.

WILL HELP YOU!

Ask Us About It

We Rebuild the Tool

We Purchase Modern Tools

THE NOTCH & MERRYWEATHER MACHINERY CO.

CLEVELAND

DETROIT

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High-grade Modern style Tools at very LOW prices

HORIZ. BORING MACHINES

"KNEE TYPE"

- 44" bar, Niles, 64" sw., power raise.
- 44" bar, Bement-M., 62" sw., pwr. raise.
- 44" bar, Bement-M., 62" sw., pwr. raise.
- 3" bar, Bement, power raise.

RADIAL DRILLS

- 8' arm, Dreses, cone drive.
- 4' arm, Dreses, cone drive.
- 4' arm, Cincinnati-B., spd.-box dr.

SLOTTERS

- 24" stroke, Niles-B.-P. (like new), motor drive, complete with motor.
- 10" stroke, Betts, cone drive.

PLANERS

- 48"x48"x15' Pond M. T. Co., 2 hds.
- 48"x48"x14' Sellers, 3 heads.
- 30"x30"x6' Cincinnati.

MILLING MACHINES

- Vertical Brown & S. No. 8, table fd. 52", circular milling att.
- Vertical, Cincinnati No. 2.
- Mfrs. style, Hendey No. 5, qk. ch.
- Mfrs. style, Becker-Brainard No. 7.
- Plain, No. 3 Cincinnati, working surface table 45"x12".
- Plain, No. 22 Brainard, working surface table 48"x14".
- Plain keyseat miller, horiz. and vert. spindles, table 60"x12", Newton.

LATHES (Used)

- Two Heavy Tri. Grd. Long Beds—1—50"x60", 50' bet. centers; tri. grd. face plate 48" diameter, 9 1/2" face, built by Israel Johnson, Jr., & Co.
- 1—50"x30", 28' bet. centers, Johnson.

OTHERS LATHES

- 50"x20' Pond, triple geared.
- 50"x13 1/2' American, qk. ch., tri. grd.
- 36"x20' Putnam.
- 36"x14' Bridgeford, geared head, quick change, motor drive.
- 30"x32' Putnam, grd. hd., motor dr.
- 28"x18' Johnson, qk. ch., taper att.
- 24"x12' Putnam, qk. ch., taper att.
- 20"x10' American, qk. ch., grd. hd.
- 18"x10' Schumacher & B., taper att.
- 18"x8' American, qk. ch., taper att.

DRIVING-WHEEL LATHE

- 80" sw., with quartering att., Bement, double-head, turns both wheels same time.

DOUBLE SPINDLE LATHES

- 26/48" sw., 18' bed, 12' centers, McCabe, with geared face-plate, ck.-jaws, etc., like new.
- 26/48" sw., 14' bed, 8' centers, McCabe, with geared face-plate.
- 26/48" sw., 12' bed, 6' centers, McCabe, with plain face-plate.

LO-SWING LATHE

- 3 1/2"x60" Fitchburg, complete equip.

TURRET LATHES

- 28" Pond, rigid type, 4 1/2" hole, rapid traverse to turret.
- 21" Gisholt, like new, 32" gap.
- 20" P. & J., 2" hole, geared head.
- 3x36" J. & L., flat turret, bar equip.
- 2x24" Jones & Lamson, flat turret, bar and chucking equip.
- 14" Auto. Screw Mch., Hartford.

GEAR CUTTERS

- 22" Bevel Gear Planer, Gleason.
- 30" Gould & E., spur and bevel.
- 36" Fellows Gear Shaper.
- 56" Eberhardt Bros. for spur.

PUNCHES AND SHEARS

- Horizontal Punch, 60" gap, H. & J., wt. 68,000 lb., arr. for mtr., no mtr.
- Punch and Shear, single-end, 50" gap, weight 33,000 lbs.
- Punch and Shear, single-end, 42" gap, with motor, Hilles & Jones.
- Punch and Shear, double-end, 36" gap, belt-dr., Long & Allstatter.
- Portable Punch, Pels.

AIR RIVETER

- 19" gap, Albree, cap. 1 1/2" rivets.

GRINDERS

- Plain Roll Grinder, table 66"x12", takes 36" centers. Bridgeport, like new.
- Universal, Landis, 16" sw., 60" cent'rs.
- Universal, Landis, 10" sw., 30" cent'rs.
- Universal, Iroquois, 12" sw., 36" cent'rs.

BENDING ROLLS

- 14' 2" bet. housings, drop-end, H. & J., top roll 11" diam., two lower rolls 8" diam. (one grooved), center suport for lower rolls, friction clutch pulley drive.
- 10' 2" bet. housings, drop-end, top roll 10 1/2" diam., two lower rolls 8", wt. 20,000 lb. Motor or belt drive.

BIG BORING MILL

- 10—16' Extension Style Upright Boring and Turning Mill, built by Betts Machine Company, adjustable from 10 to 16' swing, as desired. Has 2 heads on crossrail, having all the automatic feeds for boring, turning and facing. Housings, double-web, box form. Table 10" in depth. Belt driven, with geared feeds. In thoroughly good condition. Especially adapted for shops doing a variety of work, as it covers such a wide range. If prompt action is taken, this mill can be seen in operation near Pittsburgh—and before taking down, as orders have been issued to prepare for shipment.

Price will be made attractive, to avoid expense of shipping to our warehouse.

J. J. McCabe Lathe & Machinery Corp., 149 Broadway, New York

ReMANUFACTURED (-ORIGINATED BY US)- MACHINE TOOLS

EVERY ReMANUFACTURED MACHINE TOOL in our place represents an unusual BARGAIN. A card will bring our latest GREEN LIST containing 2000 machine tools. We welcome inspection of our plant and our process.

LATHES.

- 30-14"x6' Reed extra heavy plain.
- 1-ea. 14" & 16"x6' Flather, q. c. g.
- 6-16"x6' Reed.
- 12-17"x6' LeBlond mfg. auto.
- 22-18"x6' Boye & Emmes, q. c. g.
- 20-19"x8' LeBlond heavy, q. c. g.
- 13-20"x8' LeBlond, q. c. g.
- 69-20"x8' American, q. c. g.
- 3-20"x10' Lodge & Shipley, q. c. g.
- 26-21"x10' LeBlond heavy, q. c. g.
- 19-22"x8' Davenport.
- 8-25"x10' LeBlond heavy, q. c. g.
- 28-26"x10' Niles-Bement-Pond.
- 13-26"x9' Bridgeford, q. c. g.
- 70-26"x10' Bridgeford, q. c. g.
- 22-26"x12' Bridgeford, q. c. g.
- 1-26"x20' Bridgeford, q. c. g.
- 6-30"x11' American, geared head.
- 1-30"x20' American, geared head.
- 19-32"x12' Pittsburgh, q. c. g.
- 2-36"x14' Johnson, triple geared.
- 1-36"x19' Johnson, triple geared.
- 15-36"x30' Pittsburgh, geared head.
- 4-36"x37' Niles-B.-Pond, trip. grd.
- 4-40"x12' Fifield, triple geared.
- 1-40"x18' Fifield, triple geared.
- 2-45"x24' Pond, triple geared.

DRILLS AND RADIALS.

- 18-6 spindle Allen.
- 3-No. 6-B Henry & Wright sens.
- 1-20" Silver, wheel, lever feed.
- 1-25" Silver, sliding hd., complete.
- 4-3' American sensitive radials.
- 1-6 spindle Barnes, gang.

BORING MILLS.

- 1-30" Gisholt vertical.
- 1-ea. 34" and 72" Colburn vertical.
- 1-10' Niles vertical.
- 1-4" bar Niles horizontal.
- 1-Beaman & Smith horiz., 2 heads.
- 1-2 spindle Espen-Lucas, 2 heads.

GRINDERS.

- 12-American drill.
- 1-No. 2 Garvin hole.
- 2-No. 70 Heald internal.
- 1-12"x96" Landis plain.

- 1-No. 2 Bath surface.

- 1-8"x48" Thompson surface.

- 2-12"x36" Landis plain.

- 2-12"x36" Modern plain.

MILLERS.

- 49-No. 6 Whitney hand.

- 60-Garrigus hand.

- 22-Van Norman hand.

- 60-No. 3 Fox, p. f.

- 1-No. 0 Brown & Sharpe.

- 32-12" Cincinnati mfg.

- 2-No. 4 Cincinnati plain, s. p. d.

- 2-No. 4 Becker vertical.

- 105-No. 4 Hendey Lincoln.

- 25-No. 4 Loew-Victor Lincoln.

- 11-No. 12 Pratt & Whitney Lincoln.

- 50-No. 7-H Becker Lincoln.

- 1-Type B-34" Briggs.

- 2-18" Cincinnati automatic.

- 7-Putnam semi-automatic.

- 1-17"x10' Newton, 3 heads.

- 1-No. 1 1/2 Newton duplex.

- 1-24"x6' Ingersoll, 3 heads.

- 1-48"x10' Newton slab.

SHAPERS AND PLANERS.

- 6-26" Niles-Bement-Pond.
- 2-36"x13"x14" N.-B.-P., frog & sw.
- 1-56"x56"x10' Gray, 2 heads.
- 1-72"x72"x14' Niles, 4 heads.
- 1-96"x72"x20' Bement-Miles, 4 hds.

TURRET AND SCREW MCHS.

- 1-1" Pratt & Whitney screw.
- 1-No. 2 Brown & Sharpe screw.
- 3-2" Pratt & Whitney screw.
- 8-No. 2 Pratt & Whitney screw.
- 9-No. 2 Warner & Swasey screw.
- 5-ea. Nos. 2 & 3 Foster screw.
- 3-No. 4 Warner & Swasey.
- 17-No. 4 Wood turret screw.
- 2-3-A Warner & Swasey.
- 2-20" P. & W. grd. hd., chucking.
- 39-24" Steidle turret.
- 1-No. 6 Brown & Sharpe screw.
- 4-No. 75, 4-sp. N.-Acme auto screw.
- 2-3x36 Jones & Lamson, grd. feed.
- 1-3x36 Acme turret.
- 36-24" Steidle turret.

Write for our Green List describing these and many others

HILL, CLARKE & CO. OF CHICAGO
649 W. WASHINGTON BLVD., CHICAGO, ILL.

SIMMONS

BORING MILLS

- 10' Betts Vertical Mill, 15 h. p., var. speed motor.
- 12' Bement Extra Heavy Boring and Turning Mill, 2 swivel heads.
- 34" Bertram Vertical Turret Head Boring Mill.
- 36" Bullard New Era Type Vertical, Cutting Lub. System.
- 37" Bullard Boring and Turning Mill.
- 54" Bullard New Era Type Vertical, 4-jaw chuck.
- 24" Bullard New Era Type Vertical Turret Lathe.

PLANERS

- | | |
|--|--|
| <ul style="list-style-type: none"> 24"x24"x 8' Cincinnati, 1 hd. on rail. 30"x30"x18' Cincinnati, two heads. 42" Newton Rotary, belt or motor dr. 36"x36"x20' Woodward-Powell four heads. 48"x48"x28' Cincinnati, 2 hds, NEW. | <ul style="list-style-type: none"> 42"x42"x12' Simmons openside, two heads, NEW. 48"x48"x20' Ridgeway h.-duty, 4 hds. 50" Sellers Rotary, 24' travel. 60"x60"x20' Woodward-Powell, four heads, 35 h. p. motor rev. |
|--|--|

RADIAL DRILLS

- | | |
|---|---|
| <ul style="list-style-type: none"> 6' Pond plain radial. 6' Reed Prentice plain. 5' Niles-B-P. semi-universal. 4' Dreses plain, tapping attachment. 4' Hammond high speed. | <ul style="list-style-type: none"> 5' Fosdick full universal. 4-Spindle Harrington, ad. head. No. 310 Baker heavy duty drills, 24" capacity in steel, (3). 26" Sibley, sliding head, back geared. |
|---|---|

LATHES

- No. 326 Toledo Spinning Lathes, (2).
- 18"x12' Prentice Engine Lathe.
- 21"x11' LeBlond heavy duty, geared head.
- 24"x10' American high duty, geared head, (7).
- 24"x18' LeBlond heavy duty Engine Lathe.
- 27"x18' LeBlond Heavy Duty, q. c. g., with motor, (8).
- 27"x24' LeBlond heavy duty, d. b. g., q. c. g., NEW, (8).
- 30"x12' High Duty American, geared head, motor drive, with motor, (4).
- 36"x14' Putnam All Geared Head Lathe.
- 36"x18' Putnam Heavy Duty, Triple Geared Lathe.
- 36"x34' Bridgeford geared head, q. c. g., NEW, (6).
- 42"x20' Niles-Bement-Pond, heavy duty triple geared.
- 48"x29'-56' Niles-Bement-Pond, motor drive, NEW, (8).
- 60"x29'-56' Niles-Bement-Pond, motor drive, NEW, (4).

MILLERS

- No. 2 Cincinnati, geared head, high power universal, (4).
- No. 3 Cincinnati high power plain.
- No. 3-S Cincinnati geared head universal, (8).
- No. 3 Cincinnati heavy duty geared head vertical, (5).
- No. 4 Cincinnati high duty vertical.
- Pratt-Whitney heavy duty Slab Miller.
- Type-B Gooley-Edlund high duty "Briggs Type".

MISCELLANEOUS

- New 10-ton 48' span Niles Crane, 230 volt, d. c. equipment.
- New 5-ton Milwaukee Cranes, 38' span, d. c. motor equipment, (4).
- Double End Punching and Shearing Machine, Niles-Bement-Pond, 1 1/2" cap.
- 14"x96" Norton Plain Grinder, NEW.
- 32" Cincinnati High Duty Shapers, NEW, (8).
- No. 97 Bliss Straight Side Double Crank Geared Presses, (2).
- No. 20 Bliss Power Presses, (9).

Simmons Machine Co., Inc.

Albany, N. Y.

801 Singer Bldg., N. Y., 86-88 Exchange St., Buffalo, N. Y.

ROCKWELL ROTARY HEATING AND ANNEALING FURNACES **Sizes Nos. 152 and 155**

Here is an unusual opportunity to get a furnace that is well worth having, at a bargain price. A recent large purchase enables us to make this offer

16 No. 152 Rockwell Rotary Annealing Heat Treating Furnaces

Length of furnace shell 8'
 Dia. inside furnace shell 30"
 Dia. inside lining 18"
 Pitch of thread 8½"
 Length over all 12"
 Height to center of charging spout 4' 10"
 Height over all 6' 6"
 Width over all 5' 10"
 Weight complete 10,000 lbs.
 Oil consumption per hour, U. S. Gals. 4
 Work capacity per hour, 1000 lbs.
 Horse-power required, 1



2 No. 155 Rockwell Rotary Annealing Heat Treating Furnaces

Length of furnace shell 15'
 Dia. inside furnace shell 42"
 Dia. inside lining 28"
 Pitch of thread 13"
 Length over all 19' 9"
 Height to center of charging spout 4' 10"
 Height over all 7 feet
 Width over all 6' 6"
 Weight complete 30,000 lbs.
 Oil consumption per hour, U. S. Gals. 8
 Capacity per hour, 2,400 lbs.
 Horse-power required, 2

Price Each	Price Each
\$600.00	\$1,250.00

PRICES F.O.B. BRIDGEPORT, CONN.

3 FOX STREET

J. L. LUCAS & SON, Inc.

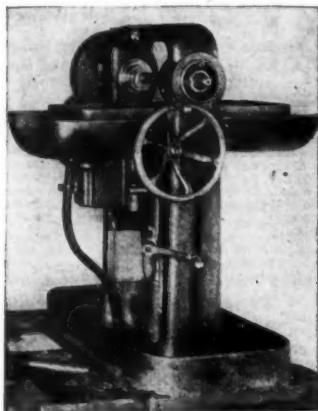
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LUCAS MACHINERY SERVICE

TO CLOSE THEM OUT WE OFFER:

**20—Type "A" Briggs Milling Machines
At \$275 each, Subject to Change in Price**

Each one is in fine condition and has counter-shaft, wrenches, and a new arbor. New oil pumps will be furnished at \$20.00 each extra.



DIMENSIONS

Traverse feed of table.....16"
Table Surface.....24"x8"
3 T slots for $\frac{3}{8}$ " bolts"
Distance between housings..12 $\frac{1}{4}$ "
Cutter space on arbor.....10"
Maximum distance table to center
of arbor.....12"

Arbor for No. 11 B. & S. taper
Spindle driving gear.....14"x2"
Ratio of gearing.....4 to 1
Weight.....2,300 lbs.
Floor space.....42"x52"
8 changes of feed to table.

J. L. LUCAS & SON, Inc.
3 Fox Street, BRIDGEPORT, CONN.
125

New Machinery For Sale

In Stock at Chicago and New York

Lathes

24"x13' Chard, q. c. g., d. b. g.	12"x 5' 6" Davis tool room,
20"x11' Chard, q. c. g., d. b. g., (2).	6"x30" and 6"x36" Dalton bench.
20"x19' Wickes, q. c. g., d. b. g.	Full line, Rivett precision bench
16"x6' Whitcomb-Blaisdell.	Full line Stark precision bench.
14"x 8' Cisco, q. c. g., d. b. g.	

Drilling Machines

3' Wisconsin sensitive radial.	21" Cleveland upright, (5).
32" Cleveland sliding head.	20" Wisconsin, all-gearred, (2).
29" Cleveland sliding head.	20" Canedy-Otto, upright, (4).
25" Cleveland upright.	14" U. S.
23 1/2" Cleveland, upright.	Belt and motor driven bench.
23" Snyder upright.	Van Dorn portable electric.
22 1/2" Cleveland upright.	

Boring and Drilling Machines

No. 9 Pawling & Harnischfeger, (2). | No. 12 Pawling & Harnischfeger.

Milling Machines

No. 2-B Fox plain.	Burke bench.
Nos. 1-A, 1-B and 0-B Fox plain.	U. S. No. 1, hand.

Grinders

No. 3 Modern universal.	Webster & Perks, No. 2 universal.
No. 1 Wilmarth & Morman univ.	No. 1 Norton cutter and tool.
Lafayette universal.	Grand Rapids drill—various sizes.
10"x32" Ott universal.	Partridge floor stands, (all sizes).
No. 103 Rivett internal.	Strand electric, flexible shaft.
No. 2 Reid surface.	Dumore, (all sizes).
6"x6" Ott internal.	

Shapers

24" Milwaukee.	16" Milwaukee.
20" Milwaukee heavy duty.	7" Rhodes horizontal.

Hack Saws

Peerless, (all sizes).	6"x6" Starrett.
No. 1 Racine.	6"x6" Economy.

Miscellaneous

Arbor presses, Atlas, all sizes.	Press, Lebanon, foot.
Buffing machine, No. 2 Blount.	Shear, 18-H Lenox, throatless.
Filing machines, Nos. 2 & 3 Barry.	Tinners' rolls, Pexto.

USED MISCELLANEOUS

Cold Saw, No. 15 Lea Simplex.	Lathe, 24" Steinle turret.
Lathe, 14"x6' Dreses Monitor. (2).	

Dale Machinery Co., Inc.

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Address all inquiries attention Department A

IN STOCK

For Immediate Delivery

BORING MILLS

No. 0 Giddings & Lewis horizontal.
60" Bullard, 2 plain heads.

DRILLING MACHINES

16" Cleveland, h. s., b. b. Drill.
6' Gang Radial Drill.
6' Prentice Radial Drill.

GEAR CUTTERS

No. 3 Farwell Gear Hobber. | 8" Hercules.

GRINDERS

No. 12 Brown & Sharpe universal. 8"x40" Morse Grinder. 14"x50" Norton Grinder. No. 12 Modern Grinder.	No. 8 Besly Disc Grinder. Wisconsin Tool and Cutter. Gisholt Tool Grinder.
--	--

LATHES

13"x 5' Blount Speed Lathe.
16"x 8' Hamilton style "A", taper and relieving attachment.
18"x10' Bradford, compound rest, double back gear.
22"x18' Bradford, compound rest.
Porter-Cable Mfg. Lathe.

MILLING MACHINES

No. 5 Hende, Lincoln type. Taylor & Fenn vertical. No. 18 Cincinnati plain No. 14 Rockford plain. No. 3-B Milwaukee plain.	No. 3 Becker vertical. No. 13 Brown & Sharpe. 12" P. & W. automatic. Type "A" Briggs. No. 32 Kempsmith.
--	---

SCREW MACHINES

No. 0 Foster, plain head, automatic chuck and wire feed.
No. 2 Foster, plain head, automatic chuck and wire feed.
No. 1 Pratt & Whitney, automatic chuck and wire feed.

TURRET LATHES

21" Gisholt.
24" Gisholt.
2"x24" Jones & Lamson.
Potter & Johnston.
14" Warner & Swasey.

PRESSES

No. 6 Eames Arbor Press.
No. 2-A Bliss Double Crank Geared Press.
No. 3 Walsh, o. b. i.
No. 19 Walsh, o. b. i.

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Back to Lower Prices

In keeping with the spirit of the times and in an endeavor to get back to normal quickly, we are offering our entire stock of used machines and many new tools at sacrifice prices. Do not ask us for a list but specify exactly what you want and we will quote you by return mail or wire, if necessary. The following are a few Machines picked at random from our stock:

LATHES

- | | |
|---|---------------------------------------|
| 9" to 13" Barnes, h. a., cp. r., new. | 20" x 10' Hamilton, double back gear. |
| 10" x 5' Summit, nearly new, (5). | 24" x 12' Fay & Scott. |
| 13-15-16 and 18 O. & S., h. a., c. r., new. | 25" x 14 Schumacher & Boye. |
| 16" x 8' Columbus, new. | 8" x 60" Fitchburg Lo-Swing. |
| 18" x 5' Fitchburg, hol. spdl., cp. r. | 21" and 24" Gisholt, turret. |

- | | |
|---|---------------------------------|
| TURRET LATHES and SCREW MACHINES | No. 2 Warner & Swasey hol. hex. |
| 24" Steinle, 64" hol. spdl., grd. hd. | Nos. 52, 53 & 56 National Acme. |
| 14" Tilted turret hand screw mche. | 14" Reed heavy duty. |
| 2x24 & 3x36 J. & L., dbl. equipment. | |

SHAPERS

- | | |
|--------------------------------|-----------------------------------|
| 14" Niles, traveling head. | 24" Walcott, geared. |
| 14" Smith & Mills, crank. | 20" Smith & Mills, geared. |
| 16" Barker, back geared crank. | 16" Springfield, crank, back grd. |

PLANERS

- | | |
|----------------------------------|-------------------------------|
| 24x24x 6' Hendey. | 54x54x16' Sellers, 4 heads. |
| 24x24x 6' Pease. | 60x60x17' Betts, 2 heads. |
| 36"x36"x12' Niles. | 60x60x20' Sellers, 4 heads. |
| 44x44x12' Pond, 4 heads. | 66x66x20' New Haven, 2 heads. |
| 48x48x16' Bement-Miles, 2 heads. | 84x84x32' Putnam, 4 heads. |

PRESSES

- | | |
|---|--|
| No. 856 Toledo, 36" stroke, 15,000 lbs. | No. 3 Robinson, 4300 lbs., o. b. i. |
| Perkins, dbl. crank, 16x24 bolster. | No. 6-A Willard 3400 lbs. incl. nable. |
| No. 35 Niagara, Stiles type, (2). | No. 14 Robinson 1500 lbs. inc., (3). |

DRILLS and RADIALS

- | | |
|--------------------------------------|--------------------------------------|
| Henry & Wright sgl. spdl., high spd. | 24", 26", 28" and 32", sliding head. |
| 34' Canedy-Otto plain, new. | 3' Morris plain, gear box drive. |
| Sensitive 1, 2, 3, 4 and 6 spindle. | 44' Prentice, gear box drive. |

Six new standard makes 20" Drills, each \$123.50

MILLING MACHINES

- | | |
|--------------------------------------|--|
| No. 25 Becker plain, (3). | No. 14 B. & S. plain. |
| Ames, Lincoln type, 10" x 40" table. | No. 2 H Brown & Sharpe plain. |
| No. 2 Kempsmith universal. | Briggs type "A" high duty, 24x8 table. |
| No. 3 Brainard, 30x7 table. | No. 32 Kempsmith Lincoln type, (3). |

GRINDERS

- | | |
|-------------------------------------|--------------------------|
| Nos. 1 & 78 W. & M. surface. | Landis 10x24 universal. |
| 16x24 Norton plain. | Litter 10x20 universal. |
| Capital, internal, practically new. | 36" and 66" Yates plate. |

MISCELLANEOUS

- | | |
|---------------------------------------|---|
| Air compressors, 12x10 and 9x8 Frank- | Hammer, Canton 6,000 lb. b.g. drop. |
| lin. 9x8 Nagle Corliss engine. | Motors, 1 to 50 h. p., 3 ph., 220 v., G. E. |
| Band saws, metal, Klemm, (2). | Oil groover, Garvin, nearly new. |
| Boring mill, 12", 2 swivel heads. | Oil separator, Springfield. |
| Brake, 8' Keene, for 16 gauge. | Pipe machines, 2", 4", 6" & 12". |
| Compressors, 9x8 and 12x10, new. | Pumps, Gould triplex, 6x8" & 7x8". |
| Gear cutter, G. & E. 36". | Punch & shears, 1/4 thru 1/2, 12" throat. |
| Gear cutter, Whiton 36"x34" face. | Riveter, high speed, 3" capacity. |
| Hammers, 40 lb. Bradley, helve, (2). | Shear, 5' Robinson, for 10 gauge. |
| Hammer, Toledo, 5,000 lb. fric. brd. | Shear, 8' Robinson, for 18 gauge. |

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Columbus, Ohio

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Turret Lathes and Screw Machines

24" Gisholt with 4 way turret tool post on carriage, through hex turret, on bed, with power rapid traverse, taper attachment, screw cutting 2 step cone, triple geared, 6 $\frac{1}{2}$ " hole in spindle (10).
21" Gisholt, same, 3 $\frac{1}{2}$ " bore.
24" Steinle, same (1).

28" Pond Rigid; same (2).
18" Gisholt, 6 $\frac{1}{2}$ " hole, screw cut'g (2).
Pratt & Whitney No. 1, Hand Screw Machine, 7/16" automatic chuck, capacity (8).
Gridley 2 $\frac{1}{2}$ " single spindle auto. (16).
Gridley 4 $\frac{1}{2}$ " single spindle auto.

Rolling and Corrugating Machines

1—Complete Rolling and Corrugating Mch cap 8" steel plates, rolls 24" diam., 72" between housings.

1—400 lb. Bloom, Lewis Foundry Machine Co., Squeezer, direct connected to steam engine.

Milling Machines

No. 6 Whitney Hand (10).
No. 22 Garvin, vertical.
No. 5 Becker, Vertical.
No. 3 Brown & Sharpe, Vertical.
Newton, 38" swing, with rotary table.
No. 5-C Becker Vert (latest model), single pulley drive.
No. 6 Becker, same.
No. 3 Pedrick & Ayer, Universal.
No. 3 Brown & Sharpe, Universal.
No. 4 Brown & Sharpe, Universal.

Punch Presses

No. 55 Ferracute, D. G. G., Straight Sided, double back grd., friction clutch, 16" str., weight 16,000 lbs.
No. 56 D. G. G., same, wt. 22,000 lbs.
No. D-201 Ferracute, same, weight 45,000 lbs.
Bliss No. 5 Solid Back.
No. E-57 Ferracute, Straight Sided, weight 140,000 lbs., 1500 tons pressure, (2).

Grinders

10x50 Norton Plain.
12"x36" Fitchburg Plain, (3).
Fitchburg, Low-Swing Lathe, 8" swing, 96" centers, (3).

Carwheel Lathes

48" Niles Double Head, 2 carriages.

Planers, Shapers and Slotters

48x48x16 Pond Planer, with 4 heads.
10" Putnam Vertical Slotter or Shaper with Compound & Rotary Power feed Table.

16" Betts—Same.
18" Niles—Same.
20" Niles—Same.
24" Niles Crank Shaper.

Miscellaneous

1000 lb. Lennox Friction Board.
1250 lb. Massillon Steam Drop Hammer.
30" throat Queen City 4" thru 4" Punch.
Pels Steel Plate Shear for 13" I-Beams.
800 lb. Erie Single Frame Steam Hammer.
1500 lb. Sgl. Frame Steam Hammer.
Plate Bending Rolls, 6' Doty, capacity 1" plate.
Baker Bros., 25" sw., Heavy Duty, high speed, single pulley drive, No. 310 Drill Presses (3).

Morton, 18" str., 2 $\frac{1}{2}$ " wide Keyseater.
8" spindle Baush Multiple Drill.
20" dia, circular head, universally adjustable, 1" capacity.
2 spindle Foote-Burt Vertical Spdl., adjustable Cylinder Borer.
72" Colburn Vertical Boring Mill, 2 swivel heads.
Acme 4 spindle Nut Tapper, 1 $\frac{1}{2}$ ".
Colburn 25" sw. Heavy Duty Drill, compound table.
2 Himhoff 6" Auto. Gear Hobbers.
4' Bickford Radial Drill, Plain.
5' Pond Radial Drill, Plain, (2).

WRITE FOR INDUSTRIAL BULLETIN No. 204

DEPENDABLE TOOLS

Exceptionally Reasonable

BUY NOW

- 1—Rochester Floor Type Horiz. Boring Mill, 3 5/16" bar—real bargain.
- 6—No. 5 Cincinnati Plain Millers, rectangular arm, latest type, like new.
- 1—42"x26" American selective triple geared head Lathe, arr. motor dr.
- 2—48"x26" Lodge & Shipley selective tri. grd. hd. Lathes, arr. motor dr.
- 1—48"x16" Lodge & Shipley selective triple grd. head Lathe, motor dr.
- 3—36"x14" Lodge & Shipley selective tri. grd. hd. Lathes, arr. motor dr.
- 1—30x30x8" G. A. Gray Planer, 1 head. Excellent. Reasonable.
- 3—6x32 Norton Plain Grinders, overhead countershafts.
- 2—12x72 Norton Plain Grinders, overhead countershafts.
- 11—Pratt & Whitney No. 12 Profilers, excellent, very cheap.
- 1—No. 33 Lucas Horizontal Boring Mill.

8—New 3½x60" Fitchburg Lo-swing single carriage Lathes, each	\$ 650.
1—60"x26" Niles heavy duty, triple geared, cone drive Lathe	2500.
1—25"x12" LeBlond heavy duty Lathe, taper, excellent condition	1250.
1—52" King vertical Boring Mill, 2 swivel heads, slightly used	4500.
1—42" King vertical Boring Mill, 2 swivel heads...	3350.
2—24" Bullard New Era Type Boring Mills, each...	2000.
1—New 61" Bullard Maxi-Mill.....	6800.
2—New 54" Bullard Maxi-Mills, each.....	6000.
1—Slightly used 16x10 Ingersoll-Sergeant Air Compressor, cap. 700', belt driven.....	1000.
1—56"x56"x16" Gray Planer, 2 heads on rail, 2 side heads, motor drive	6600.

- 1—24" Ohio back geared Shaper.
- 1—No. 11 Perkins Trimming Press.
- 1—Double End Industrial Punch and Shear, 1" through 1".
- 1—Single End Cleveland Punch and Shear, 2" through 2".
- 3—Model C Becker vertical Milling Machines.
- 1—36" Bickford Radial Drill, cone drive.
- 2—36" Flathers Gear Cutters.
- 1—3-A Cincinnati Gear Cutter.
- 3—No. 12 Barber-Colman Gear Hobbers.
- 1—No. 4 Williams & White Bulldozer.

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Machinery for Immediate Delivery

SCREW MACHINES

No. 4 W. & S., p. f. to turret.
No. 0 Brown & Sharpe automatic.
No. 2 B. & S. automatic, $\frac{1}{4}$ " cap.
No. 1 Chicago automatics, $\frac{1}{4}$ " cap.
No. 1 Bardons & Oliver, 1" cap.
No. 3 Stecher, 1 5-16" cap.
No. 1 $\frac{1}{2}$ P. & W., $\frac{1}{4}$ " cap.
1 $\frac{1}{2}$ " Cleveland auto., model B.
 $\frac{1}{4}$ " Cleveland auto., model B.
1 $\frac{1}{2}$ " Cleveland auto., model A.
No. 52 National Acme 4 spindle.
No. 515 National Acme 4 spindle.

GRINDERS

6"x20" Fitchburg plain auto.
12x30" Fitchburg plain auto.
12x36" Fitchburg plain auto.
No. 14 Gardner disc, univ. tables.
No. 14 Besly disc, univ. tables.
No. 1 W. & W. Surface.
No. 1 W. & W. tool and cutter.
1 Hartford surface.

MILLERS

No. 0 Steptoe b. g. plain.
20x7x17 Oesterlein b. g. plain.
No. 25 Bilton b. g. plain.
No. 3 $\frac{1}{2}$ Fox hand, p. f., b. g.
No. 1 $\frac{1}{2}$ American b. g., p. f., plain.
3" & 6" Lees Bradner thread.
3" Foster thread.
No. 12 P. & W., Lincoln type.

DRILLING MACHINES

21" Superior, tapp. attach.
24" Milwaukee, s. h., p. f.
24" Colburn D-4, h. d.
30" Bickford, b. g., p. f.
42" Wright, s. h., b. g.
54" Davis, b. g., p. f.
2 spindle Edlund, b. b., h. s.
6 spindle Allen, b. b., h. s.
12 spindle P. & W. mult., $\frac{1}{4}$ " cap.
16 spindle P. & W. mult., $\frac{1}{4}$ " cap.

SHAPERS

14", 16" & 20" Steptoe.
20" Walcott.
24" Lodge & Davis.
24" Queen City.

PUNCH PRESSES

No. 3 Norton incl.
No. 3 R. & K., incl.
No. 17 Bliss, o. b. l.
No. 18 Bliss, o. b. l.
No. 4 McDonald incl.
No. 5 $\frac{1}{2}$ Walsh o. b. i. 4" str. grd.
No. 65-N Bliss, double acting.
No. 68-C 2 Bliss, double acting.
No. 68-W Bliss, double acting.
No. 20 Bliss.
Nos. 58-59-59 $\frac{1}{2}$ Toledo, s. s.

LATHES

No. 2 Niles axle, 8' cent.
No. 3 Niles axle.
3 $\frac{1}{2}$ x60, 6x60, 8x60 & 8x108 Lo-Swing.
14x6 Filsmith, q. c. g.
14x6 Reed-Prentice, h.d., oil pan bed.
16x7 Oliver tool room, q. c. g.
16x8 Gisholt turret.
17x6 LeBlond, q. c. g.
18x8 Oliver, t. r., q. c. g.
20x8 Hamilton, s. q. c. g.
24x12 Cisco, q. c. g.
24x12 Gisholt turret.
24"20 American, q. c. g.
23x24 Putnam standard.
28x10 Pond, q. c. g.
30x12 Putnam, geared head.
30x13" Oliver, geared head.
32x28 Bridgeford, geared head.
26x16 Standa. d. raised to 60".
36x22 Bridgeford, geared head.
52" Niles car wheel.
50x20 Fifield, triple geared.
96x24 Fifield, triple geared.

MISCELLANEOUS

30" Rogers Boring Mill.
20th Century Die Filing Machine.
No. 404 Oliver Die Filing Machine.
6x6 Curtis Compressor.
50 h. p. Atlas Steam Engine.
100 h. p. Watertown Auto. Steam Eng.
50 h. p. Chalmers Lightning Gen.
Largest stock of machine tools.
This is only a partial list.

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Why Pay More For New Equipment When These Used Machines Will Give You The Service You Are After?

MILLING MACHINES

Pratt & Whitney 12" semi-auto., drop table.
Cincinnati No. 1 universal, with vertical milling attachment.
Cincinnati No. 4 vertical, high power.
Whitney No. 6 hand, with power feed.
Knight No. 2 combination mill and drill, regular equipment.
Brainerd No. 24 back geared plain, slotting attachment.

ENGINE LATHES

Star 9"x4', foot, pl. rest, chuck.
Flather 14"x6', cam cutting att.
Prentice 14"x6', c. r., fr. c. s.
Reed 14"x6', c. r., taper, chuck.
Reed 18"x12', pl. rest, semi q. c., new type headstock.
Fay & Scott 18"x8', c. r., reg. equip., chuck.
L. & S. 18"x10', q. c. g., chuck.
Bradford 20"x8', c. r., reg. equip.
Lathe & Morse 20"x10', elev. rest, raised to 24".
Reed 20"x10', c. r., imp. tail-at.
Blaisdell 26"x12' c. r., p. c. f., heavy duty.
Perkins 40"x18', c. r., chuck.

SCREW MACHINES

National-Acme No. 515, 9' 16" cap., auto., regular equipment.
Pratt & Whitney No. 1 hand, latest pattern.
Pratt & Whitney, 3" cap., single spindle auto.
Foster No. 1, 3/16" hand, regular equipment.
Garvin No. 2 plain head, 1 1/2" cap., single spindle auto.
Gridley 2 1/2" cap., four spindle, auto. standard and extra equipment.
Costello 1" cap. hand, 16 collets, d. f. c/s.
NEW HAVEN 36"x36"x10' SINGLE HEAD PLANER.

LYND-FARQUHAR CO., Dept. G Quality Machine Tools
BOSTON 9, MASS.

SPECIALS Immediate Delivery

- | | |
|--|--|
| 1-59 1/4 Toledo Straight Side Press, dbl. grd., 12" str., tie rod frame, weight 70,000 lbs., spring pressure attachment. | 1-No. 77 1/2 Bliss Straight Side, double grd., 8" stroke, tie rod. |
| 1-59 Toledo Straight Side Press, double geared, 12" stroke, weight 50,000 lbs. | 1-76 1/2 Bliss Straight Side Press, 8" stroke, tie-rod. |
| 1-No. 666 Toledo Knuckle Joint Embossing Press, cap. 1,000 tons. | 1-Long & Allstatter Mult. Punch, 7" shaft, 96" between uprights. |
| 1-No. 14 Toledo Horn Press, fly-wheel type, table included. | 1-D-66 Ferracute Reducing Press. |
| 1-No. 27 Bliss Knuckle Joint Embossing Press, cap. 1,000 tons. | 1-D-65 Ferracute Reducing Press. |
| 1-No. 2-W Bliss Wiring Press. | 1-No. 72 Consolidated Press. |
| 1-No. 69-N Bliss Cam, fly-wheel. | 1-No. 65 Consolidated Press. |
| | 1-24" Gould & Eberhardt Shaper. |
| | 1-No. 4 Williams-White Bulldozer. |
| | 1-No. 5 Williams & White Bulldozer. |
| | 1-84" Niagara Foot Squaring Shear. |

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16"x6' Sidney double back gear, quick change gear Lathe, H. S. & C. R.; all regular equipment; each.....	\$ 525.
26"x12' 10" Wickes double back gear, quick change gear Lathe, with taper attachment; all regular equipment, Factory price \$2750; this one.....	2250.
20" Champion, wheel and lever feed Drills; 4 only. Each	140.
Wilmarth & Morman B. Pt. New Yankee Drill Grinder; cap. 1/4" to 2 1/2". Factory price \$180; price.....	125.
Fox No. 1 B Hand and Power Feed Miller, with arbor. Fac- tory price \$633; price.....	475.

SLIGHTLY USED TOOLS

No. 20 Excelsior Machine & Tool Co. Power Punch, cap. 1/4" in 1/4", 20" throat. Price.....	\$ 200.
No. 3 Baush 27-spindle multiple drill, rectangular head 20x40". Price.....	1500.
Warner & Swasey No. 4 Universal Turret Lathe, with cross slide carriage with power longitudinal and cross feed, power feed to turret, with tools and chuck. Price.....	1000.
Wood No. 4 plain head Tilted Turret Lathe with hand feed to turret. Price.....	450.
16" Smith & Mills back geared Shaper, with vise and c. s.	650.
3' American Sensitive Radial Drill, with tapping attmt.....	600.
All these used tools are latest models and about 95% condition.	
50 HP General Electric, Type KT Motors, 3 phase, 60 cycle, 220 volt, speed 1200 RPM; with compensators, pulleys and bases. Each.....	\$ 500.
40 HP, as above. Price.....	450.
Above motors slightly used and 95%.	
New Advance single-phase motors, 110-220 volt, speed 1750 RPM:	
1/4 HP with pulley.....	\$ 40.
1/2 HP with pulley.....	50.
1 HP with pulley and rails.....	70.
2 HP with pulley and rails.....	95.

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2323 North Ninth St.,

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- 1—Taylor & Fenn, No. 1, Type D, Bench Drill.
- 1—Taylor & Fenn, No. 3, Type A, Drill Press, three spindle.
- 1—Weigel, 21" Sliding Head Drill, belt driven.
- 1—Dauber-Kratsch 20" Upright Drill.
- 1—Dauber-Kratsch 3' High Speed Radial.

LATHES

- 1—Hamilton 20"x10' Style B Lathe, 3 step, DBC. bk. gear.
- 2—Rockford 9"x12" Geared Head Manufacturing Lathes.
- 1—Rockford 16"x6' Cone Head High Power Manufacturing Lathe.
- 3—Rockford 16"x6' Tool Room Lathes.

HAMMER

- 1—Beaudry No. 7, 200 lb. Champion Type, belt driven.

SAW

- 1—Racine No. 1 Hack Saw.

GRINDERS

- 1—Norton No. 2 Universal Tool and Cutter Grinder.
- 1—Gardner No. 4 Disc Grinder.
- 1—Ott 10"x32" Universal Grinder.
- 1—Taylor & Fenn Bore Grinder.
- 1—Sterling Universal Tool and Cutter Grinder.
- 1—Taylor & Fenn 20" Wet Tool Grinder.
- 2—Gardner No. 3 Polishing Lathes.
- 1—Fitchburg 4x20 Grinder.

MILLING MACHINES

- 2—Taylor & Fenn Vertical Milling Machines.
- 1—Craftsman No. 2 Continuous Rotary Miller.

SHAPERS

- 1—Ohio 14" plain, cone drive.
- 1—Ohio 16" plain, cone drive.

FOOT PRESS

- 1—Taylor & Fenn Spring Foot Press.

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Incorporated

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- 4—Ideal Precision Lathes, 7" swing, comp. slide, grinding attachment.
- 3—Ames Precision Lathes, 8" swing.
- 2—12 & 14" x 6' Worcester Tool Room, taper attachment, pan and collet.
- 1—Each Sidney Medium Pattern Lathes, 14, 16, 18 and 20" by 6, 8 and 10' beds, d. b. g., 3-step cone, q. c. g.
- 1—Each Sidney Heavy Duty Lathes, 15, 17, 19, 25 and 27" by 6, 8, 10, 12 and 14' beds, d. b. g., 3-step cone, q. c. g.
- 1—34x60 Fitchburg Lo-Swing.
- 1—14x 6 Monarch, h. s., c. r.
- 1—15x 6 Von Wyck, c. r., h. s.
- 1—16x 6 Hamilton, c. r., h. s.
- 1—17x 6 Cincinnati, c. r., h. s.
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- 1—24x12 Monarch, c. r., h. s., q. c.
- 1—25x 8 Economy hvy. duty, c. r., h. s.

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- 1—No. 3 Foster Hand Screw Mch.
- 3—J. & L. 3x36 Flat Turrets.
- 2—Gridley 14", 4-Spdl. Automatics.

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- 2—No. 1 American Plain.
- 1—No. 1 American Universal.
- 2—No. 1 U. S. Hand Millers.
- 1—No. 2 American Plain (used).
- 7—No. 32 Kempsmith Lincoln Type.
- 1—No. 1 Cincinnati Plain, M. D.
- 1—No. 2 Cincinnati Plain, M. D.
- 1—No. 4 Cincinnati Univ., M. D.
- 1—No. 2 Becker-Brainard.
- 1—Ingersoll, Horiz. Slab 20x20x8.

Grinders

- 3—No. 2 Oakley Univ. C. & T.
- 2—10x36" Thompson Full Univ.
- 1—Used No. 2 Woods Cutter.
- 1—Grand Rapids Drill, 24" cap.
- 1—No. J.A. Yankee Drill.
- 1—No. 2 Manhattan Surface.
- 1—No. 1 Wilmarth & M. Surface.
- 1—No. 2 Cincinnati Cylindrical.
- 2—No. 75 Heald Internal.
- 1—Gisholt Univ. Tool.

Drilling Machines

- 8—14, 21, 24, 26 and 28" Drills.
- 1—No. 4 Foote-Burt 6-sp. Rail Drill, with No. 5 Morse taper.
- 10—2, 3, and 4 spindle Sensitive.
- 1—Baush Multiple, arranged for 24 spindles; now with 12 spindles; takes 60" bet. columns; drills in any circle 12-48" dia.; approximate weight 30,000 lbs.
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- 1—Baush Multiple, arranged and equipped with 16 spindles; No. 1 M. T.
- 1—No. D-31 Fox Multiple, arranged for 14 spindles but equipped with 10; 25" round head; No. 2 Morse taper.
- 1—4' Universal Radial.
- 1—5' Universal Radial.
- 1—4' Lodge & Davis Plain Radial.
- 1—Barnes 6-spindle 14".

Shapers

- 6—16" and 20" Whipp.
- 1—14" Hendey.
- 1—15" Potter & Johnston.
- 1—16" Walcott & Wood.
- 1—20" Hendey.

Boring Mills

- 1—37" Niles Boring & Turning Mill, 2 swivel heads.
- 1—34" Colburn, 5-hole turret.
- 1—50" Sellers Car Wheel Borer.

Planers

- 1—24"x24"x 5' Gray, 1 head.
- 1—26"x24"x 8' Pond, 2 heads.
- 1—40"x40"x10' New Haven.

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DRILLING MACHINES

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|-------------------------------------|---|
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| 6' Baush, Plain Radial, like new. | 5' Niles-Bement-Pond, motor driven. |
| 6' Bickford, Semi-Universal Radial. | 4' Gang, gear box drive. |

DRILLS—Multi-Spindle

- | | |
|--|-------------------------------------|
| 4—(NEW) Aurora 28", s. h., b. g., p. f., auto. stop. | 2-sp. Foote-Burt heavy rail type. |
| 6 spindle Baush, 1" capacity. | 4 & 6 spindle Rockford, auto. feed. |
| 3 & 4 spindle Barnes, 20" gang. | 4 & 6 spindle Allen, sensitive. |

LATHES

- | | |
|--|----------------------------|
| 60"x20' Fifield, D. C. Motor Drive. | 28"x18' Johnson. |
| 52"x22' New Haven triple geared, pulley drive. | 20"x8' & 10' American. |
| 60"x17' New Haven Pulley. | 20"x8' Lodge & Shipley. |
| 36"x14' Putnam triple geared. | 14"x6' Mulliner tool room. |
| 36"x12' Pond triple geared. | 14"x6' Monarch. |
| 30"x12' Johnson. | 12"x5' P. & W. |
| | 10"x4' Seneca Falls. |

MILLING MACHINES

- | | |
|--|---------------------------------|
| 8—No. 5C Becker Verticals, new, price right. | No. 25 Becker Plain. |
| No. 3 LeBlond, plain, high duty. | No. 2 Hendey Norton Plain. |
| No. 8 Becker-Brainard Plain. | No. 14 Hendey Norton Universal. |
| No. 2 Kempamith Universal. | No. 2 Van Norman Duplex. |
| 50"x8' Ingersoll Slab. | 31"x5' Newton Vertical Slab. |

PLANERS

- | | |
|--|--|
| 84"x84"x13' Sellers, 3 heads, belt driven. | 42"x42"x12' Pond Machine Tool Co., 2 heads, belt driven. |
| 48"x48"x14' Powell, 4 heads, reversible motor drive, complete with electrical equipment. | 36"x36"x12' Niles-Bement-Pond, 3 heads. |
| 48"x48"x16' Bement-Miles, 4 heads, belt driven. | 30"x30"x10' Flather, 2 heads, belt driven. |
| | 30"x30"x6' Gray, 3 heads, parallel dr. |

PRESSES

- | | |
|-------------------------------|--|
| No. 55 Adriance S. A. | No. 1 Farrel straight side, 8" stroke. |
| No. 512 Bliss, triple action. | D. D. 4 Ferracute, D. A., roll feed. |

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- | | |
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| 2-16" Newark, box table and vise. | 4-15" Hendey, box table and vise. |
| 4-15" Smith & Mills, box table and vise. | 3-18" Morton, extra hvy., draw-cut. |
| | 18" Fitchburg, traveling head. |

MISCELLANEOUS

- | | |
|-----------------------------------|--------------------------------------|
| 10' Bement Boiler Plate Rolls. | No. 26 Buffalo Slitting Shear (new). |
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| 12" New Haven Slotter. | 10" Newton Slotter (new). |
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Lathe, Geared Head, S. P. D., 14'
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Lathe, adaptable direct motor
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Grinder, Norton universal cutter
and tool.

Grinder, Cincinnati universal
cutter and tool.

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Lathe, 24" x 10' Schumacher-B.

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No. 164 Consolidated.

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Bridgeford, grd. head, 27" x 14'.

2—Fitchburg Lo-Swing.

2—Bridgeford Axle turning, d. e.

2—Bridgeford 27" x 9", d. b. g., q. c. g.

24" x 10' Lodge & Shipley, q. c. g.

16" x 7' Lehmann, q. c. g., taper.

16" x 6' Whitcomb-B., q. c. g.

16" x 6' Bradford.

13" x 4' South Bend.

14" x 8' Flather, plain rest.

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5—Hendey No. 4 Lincoln type.

5—Fox No. 3½ automatic.

7—Bristol No. 0 hand feed.

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Henry & W., h. s., b. b., 2 spdl.

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MISCELLANEOUS.

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 20" Weigle.
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 22½" Barnes.
 23" Snyder b. g. p. f.
 24" Superior b. g. p. f.
 28" Superior b. g. p. f.
 32" Superior b. g. p. f.
 16" Sipp Hi-Speed p. f.
 16" 2-spindle Sipp.
 12" Wiley Bench Motor Driven.
 Fay Horizontal Bench.
 Overland Horizontal Bench.
 5-spindle Detroit Automatic.
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 No. 1 P. & W. 2-spindle Gun Barrel.
 2-spindle Diamond Gun Barrel Reaming.
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 No. 1 Foote-Burt 3-spindle Adj. Drill.
 No. 1 Foote-Burt 2-spindle Adj. Drill.
 No. 00-SS Garvin Duplex Horiz.
 No. 2 Foote-Burt 4-spindle Rail Type.
 4-spindle Foote-Burt Adjustable.
 8-spindle Foote-Burt Rail Type.
 22½" Barnes 4-spindle Gang.
 No. 1 Baush 16-spindle Multiple.
 No. 3 Fox 20-spindle Multiple.
 No. 25 Natco Multiple 20-spindle.
 No. 37 Natco Multiple 20-spindle.
 No. M-4 Natco Multiple 20-spindle.
 No. 30 Natco Multiple 42-spindle.
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Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Chucks, Lathe

Thomas Elevator Co., 31 S. Hoynes Ave., Chicago

Classified Finding Index

Chucks, Magnetic
Heald Machine Co., Worcester, Mass.

Chucks, Wrenchless
Thomas Elevator Co., 31 S. Hoyne Ave., Chicago

Clutches, Friction
Edgemont Machine Co., Dayton, Ohio
Milwaukee Shaper Co., Milwaukee, Wis.

Cold Saws
Burke Machine Tool Co., Connecticut, Ohio
Cochrane-Hy Co., Rochester, N. Y.
Knowlton Machine Co., Westbrook, Me.
Peter Bros. Mfg. Co., Algonquin, Ill.

Collets, Lathe and Screw Machine
Bath & Co., Inc., John, Worcester, Mass.
Hardinge Bros., 1770 Bertau Ave., Chicago
Morrison Machine Products, Inc., Rochester, N. Y.

Couplings, Flexible
Cooper Flexible Transmission Co., Inc., Brooklyn

Cranes, Hand Power
Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.
Weaver Mfg. Co., Springfield, Ill.

Cranes, Portable
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Canton Foundry & Mch. Co., Canton, Ohio
Weaver Mfg. Co., Springfield, Ill.

Cranes, Traveling
Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.

Crank Pin Turning Machine
Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cutters, Adjustable
McCrosky Tool Corporation, Meadville, Pa.
Madison Mfg. Co., Muskegon, Mich.

Cutters, Bolt
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Cutters, Keyseating
Elco Tool Corporation, Rockford, Ill.
Scully-Jones & Co., Ry. Exch. Bldg., Chicago
Whitney Mfg. Co., Hartford, Conn.

Cutters, Milling
Brown & Sharpe Mfg. Co., Providence, R. I.
Clough, R. M., Meriden, Conn.
Elco Tool Corporation, Rockford, Ill.
Molback Tool & Machine Co., Boston
Whitney Mfg. Co., Hartford, Conn.

Cutting-Off Machines
Davis Machine Tool Co., Rochester, N. Y.
Etna Mfg. Co., Toledo, Ohio
Peter Bros. Mfg. Co., Algonquin, Ill.

Cylinder Boring Machines, Portable
Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cylinder Grinders
B. L. Schmidt Co., Davenport, Iowa

Cylinder or Dome Facing Machines
Underwood Corp., H. B., Philadelphia

Die Heads, Self-Opening
Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland

Dicing Machines
Henry & Wright Mfg. Co., Hartford, Conn.

Dies, Pipe Threading
Bignall Keeler Mch. Wks., Edwardsville, Ill.

Dies, Screw and Thread Cutting
Hardinge Brothers, 1770 Bertau Ave., Chicago
National Acme Company, Cleveland

Dies, Self-Opening Adjustable
Modern Tool Co., Erie, Pa.
Murchey Mch. & Tool Co., Detroit, Mich.
Rickert-Shafer Co., Erie, Pa.
Victor Tool Co., Inc., Waynesboro, Pa.

Dogs, Machine
Ready Tool Co., Bridgeport, Conn.

Drilling Machine Heads
Nelson-Blanch Mfg. Co., Detroit, Mich.
United States Drill Head Co., Cincinnati
United States Machine Tool Co., Cincinnati

Drilling Machines, Bench
Avey Drilling Machine Co., Cincinnati
Barnes Co., W. F. & John, Rockford, Ill.
Burke Machine Tool Co., Connecticut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
High Speed Hammer Co., Rochester, N. Y.
Reed Co., Francis, Worcester, Mass.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Horizontal
Fawling & Harnischfeger Co., Milwaukee, Wis.

Drilling Machines, Multiple Spindle
Avey Drilling Machine Co., Cincinnati
Detroit Machine Tool Co., Detroit, Mich.
Henry & Wright Mfg. Co., Hartford, Conn.
National Acme Company, Cleveland
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Post
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati

Drilling Machines, Radial
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Fawling & Harnischfeger Co., Milwaukee, Wis.
Taylor & Fenn Co., Hartford, Conn.
Sipp Machine Co., Paterson, N. J.

Classified Finding Index

Drilling Machines, Sensitive

Avey Drilling Machine Co., Cincinnati
Burke Machine Tool Co., Conneaut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Hardinge Brothers, 1770 Berteau Av., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.
United States Machine Tool Co., Cincinnati
Wisconsin Electric Co., Racine, Wis.

Drilling, Milling and Boring Machines, Vertical

Aurora Tool Works, Aurora, Ind.
Knight Machinery Co., W. B., St. Louis, Mo.

Drilling Machines, Vertical

Aurora Tool Works, Aurora, Ind.
Avey Drilling Machine Co., Cincinnati
Barnes Co., W. F. & John, Rockford, Ill.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Davis Machine Tool Co., Rochester, N. Y.
Frontier Mch. Tool Co., Inc., Buffalo, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
Hinckley Machine Works, Hinckley, Ill.
Minster Machine Co., Minster, Ohio
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling and Tapping Attachments

Aurora Tool Works, Aurora, Ind.
Henry & Wright Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Turner Machine Co., Danbury, Conn.

Drills, Portable Electric

Wisconsin Electric Co., Racine, Wis.
Wodack Electric Tool Corporation, 25 S. Jefferson St., Chicago

Dust Handling Equipment

Knickerbocker Co., Jackson, Mich.

Emery Stands

Blount Co., J. G., Everett, Mass.
Marschke Mfg. Co., Inc., Indianapolis, Ind.
Partridge, E. O., 2047 W. Lake St., Chicago

Emery Wheel Dressers and Cutters

Taylor & Fenn Co., Hartford, Conn.

Facing Heads, Automatic

Mummert-Dixon Co., Hanover, Pa.

Feeders, Oil and Soda Water

New Britain Machine Co., New Britain, Conn.

Flexible Shafts

Strand & Co., N. A., 549 Washington Blvd., Chicago

Forges

Canedy-Otto Mfg. Co., Chicago Heights, Ill.

Forgings, Drop

Western Tool & Mfg. Co., Springfield, Ohio

Forgings, Hollow Bored

American Hollow Boring Co., Erie, Pa.

Furnaces

Bennett Co., W. H., Elmwood, Conn.

Furniture, Machine Shop

New Britain Machine Co., New Britain, Conn.
Western Tool & Mfg. Co., Springfield, Ohio

Gauges, Taper

Hartford Special Mch. Co., Hartford, Conn.
Way Co., A. F., Hartford, Conn.

Gauges, Thread

Bath & Co., Inc., John, Worcester, Mass.

Gear Cutting Machines

Brown & Sharpe Mfg. Co., Providence, R. I.

Grinding Machines, Bench

Blount Co., J. G., Everett, Mass.
Partridge, E. O., 2047 W. Lake St., Chicago

Grinding Machines, Cutter, Reamer and Tool

Barnes Co., W. F. & John, Rockford, Ill.
Blount Co., J. G., Everett, Mass.
Brown & Sharpe Mfg. Co., Boston
Clough, R. M., Meriden, Conn.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Marschke Mfg. Co., Inc., Indianapolis, Ind.
Modern Tool Co., Erie, Pa.
Mummert-Dixon Co., Hanover, Pa.
National Acme Co., Cleveland
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Cylinder

Heald Machine Co., Worcester, Mass.
Whitney & Son, Baxter D., Winchendon, Mass.

Grinding Machines, Cylindrical

Brown & Sharpe Mfg. Co., Providence, R. I.
Detroit Machine Tool Co., Detroit, Mich.
Greenfield Machine Co., Greenfield, Mass.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Schmidt Co., B. L., Davenport, Iowa
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio

Grinding Machines, Die

Manhattan Machine & Tool Works, Grand Rapids, Mich.
Modern Tool Co., Erie, Pa.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Drill

Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Face

Marschke Mfg. Co., Inc., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio

Grinding Machines, Internal

Heald Machine Co., Worcester, Mass.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio
Whitney & Son, Baxter D., Winchendon, Mass.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Oilstone

Mummert-Dixon Co., Hanover, Pa.

Grinding Machines, Portable

Marschke Mfg. Co., Inc., Indianapolis, Ind.
Mummert-Dixon Co., Hanover, Pa.
Strand & Co., N. A., 549 Washington Blvd., Chicago
Wisconsin Electric Co., Racine, Wis.
Wodack Electric Tool Corporation, 25 S. Jefferson St., Chicago

Classified Finding Index

Grinding Machines, Snagging
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Marchke Mfg. Co., Inc., Indianapolis, Ind.

Grinding Machines, Surface
Reald Machine Co., Worcester, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Tap
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.

Grinding Machines, Universal
Brown & Sharpe Mfg. Co., Providence, R. I.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Hack Saw Machines
Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago
Peerless Machine Co., Racine, Wis.
Western Tool & Mfg. Co., Springfield, Ohio

Hammers, Air
Nazel Engineering & Mch. Wks., Philadelphia

Hammers, Belt & Motor Driven
Beaudry & Co., Boston
Nazel Engineering & Mch. Wks., Philadelphia
United Hammer Co., Boston

Hammers, Electric
Wodack Electric Tool Corporation, 25 S. Jefferson St., Chicago

Hammers, Power
Beaudry & Co., Boston
Nazel Engineering & Mch. Wks., Philadelphia
United Hammer Co., Boston

Hammers, Riveting
High Speed Hammer Co., Rochester, N. Y.
Quickwork Co., St. Marys, Ohio

Heads, Dividing
Simmons Machine Co., Albany, N. Y.
Willard-Middletown Machine Co., Cincinnati

Heads, Index
Dickow, Fred C., 3504 W. Lake St., Chgo.

Hoists, Electric
Euclid Crane & Hoist Co., Euclid, Ohio
Thomas Elevator Co., 31 S. Hoyne Ave., Chicago
Weaver Mfg. Co., Springfield, Ill.

Hoists, Electric Traveling
Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.

Hoists, Portable
Canton Foundry & Machine Co., Canton, Ohio

Holders and Counterbores
Manufacturers Machine Products Co., Detroit, Mich.

Jigs, Fixtures, Tools, Etc.
Hartford Special Mch. Co., Hartford, Conn.
Hinkley Machine Works, Hinkley, Ill.
Way Co., A. F., Hartford, Conn.

Joints, Universal
Borgeson Manufacturing Co., Inc., Torrington, Conn.
Cooper Flexible Transmission Co., Inc., Brooklyn

Keyseating Machines
Bucher-Smith Co., East Liverpool, Ohio
Chattanooga Mch. Co., Chattanooga, Tenn.
Davis Machine Tool Co., Rochester, N. Y.
National Machine Tool Co., Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Lathe Accessories and Attachments
Hardinge Bros., 1770 Bertens Ave., Chicago
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.

Lathes, Automatic
National Acme Company, Cleveland

Lathes, Bench
Blount Co., J. G., Everett, Mass.
Hardinge Brothers, 1770 Bertens Av., Chicago

Lathes, Engine
Barnes Co., W. F. & John, Rockford, Ill.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Davis Machine Tool Co., Rochester, N. Y.
Hardinge Bros., 1770 Bertens Ave., Chicago
Lehmann Machine Co., St. Louis, Mo.
Monarch Machine Tool Co., Sidney, Ohio
Mueller Machine Tool Co., Cincinnati
Rockford Lathes & Drill Co., Rockford, Ill.
Sidney Tool Co., Sidney, Ohio
Standard Lathe Works, Cincinnati
Willard Machine Tool Co., Cincinnati

Lathes, Foot Power
Barnes Co., W. F. & John, Rockford, Ill.

Lathes, Horizontal Turret
Davis Machine Tool Co., Rochester, N. Y.
Steinle Turret Machine Co., Madison, Wis.

Lathes, Short Cut
Sidney Tool Co., Sidney, Ohio

Lathes, Speed and Hand
Blount Co., J. G., Everett, Mass.

Lockers, Shelving and Cupboards, Steel
Terrell's Equipment Co., Grand Rapids, Mich.

Mandrels, Expanding
Bath & Co., Inc., John, Worcester, Mass.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, Ohio

Mandrels, Solid
Nicholson & Co., W. H., Wilkes-Barre, Pa.

Measuring Devices
Van Keuren Co., The, Boston

Metal Cutting Machines, Sheet
Quickwork Co., St. Marys, Ohio
Savage Co., W. J., Knoxville, Tenn.
Way Co., A. F., Hartford, Conn.

Micrometers, Internal
Bath & Co., Inc., John, Worcester, Mass.

Milling Attachments
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Hinkley Machine Works, Hinkley, Ill.
Knight Machinery Co., W. B., St. Louis, Mo.
Willard-Middletown Machine Co., Cincinnati

Classified Finding Index

Milling Machines, Bench

Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Bros., 1770 Berteau Ave., Chicago
Simmons Machine Co., Albany, N. Y.

Milling Machines, Hand

Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Bros., 1770 Berteau Ave., Chicago
United States Machine Tool Co., Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Milling Machines, Horizontal

Beaman & Smith Co., Providence, R. I.

Milling Machines, Plain

American Milling Machine Co., Cincinnati
Beaman & Smith Co., Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Hardinge Bros., 1770 Berteau Ave., Chicago

Milling Machines, Portable

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Milling Machines, Universal

American Milling Machine Co., Cincinnati
Brown & Sharpe Mfg. Co., Providence, R. I.

Milling Machines, Vertical

Beaman & Smith Co., Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Clough, R. H., Meriden, Conn.
Hardinge Bros., 1770 Berteau Ave., Chicago
Knight Machinery Co., W. B., St. Louis, Mo
Taylor & Fenn Co., Hartford, Conn.

Motors, Electric

Reliance Electric & Eng. Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Nut Facing Machines

Victor Tool Co., Inc., Weymouth, Pa.

Oil Cups

Gits Bros. Mfg. Co., 1940 S Kilbourn Av., Chicago
Tucker, W. C. & F. C., Hartford, Conn.

Oil Extractors

Curtis, Albert B., Estate, Worcester, Mass.

Oil Hole Covers

Tucker, W. C. & F. C., Hartford, Conn.

Pattern Shop Machinery

Towsley Mfg. Co., John T., Cincinnati

Pipe Bending Machines

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Pipe Cutting and Threading Machines

Bignall & Keeler Mch. Wks., Edwardsville, Ill.
Simmons Machine Co., Albany, N. Y.

Piston and Piston Ring Machines

National Acme Company, Cleveland.

Planer Attachment, Radius

Underwood Corp., H. B., Philadelphia

Planer Attachment, Slotting

Moore Co., H. A., Rochester, N. Y.

Planer Tools, Circular

Underwood Corp., H. B., Philadelphia

Planers, Valve Seat, Portable

Fedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Polishing and Buffing Machines

Blount Co., J. G., Everett, Mass.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
New Britain Machine Co., New Britain, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago
Wilmarth & Norman Co., Grand Rapids, Wis.
Wisconsin Electric Co., Racine, Wis. (Mich.)

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Lourie Mfg. Co., Springfield, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Weaver Mfg. Co., Springfield, Ill.

Presses, Broaching

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Lourie Mfg. Co., Springfield, Ill.

Presses, Foot

Atlas Press Co., Kalamazoo, Mich.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Rockford Iron Works, Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago

Presses, Power

Hendley & Whittemore Co., Beloit, Wis.
Loshbough Jordan T. & M. Co., Elkhart, Ind.
Rockford Iron Works, Rockford, Ill.
Willard Middletown Machine Co., Cincinnati

Presses, Punch

Henry & Wright Mfg. Co., Hartford, Conn.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H., 417 E. 31st, N. Y.
Loshbough Jordan T. & M. Co., Elkhart, Ind.
Lourie Mfg. Co., Springfield, Ill.
Partridge E. O., 2047 W. Lake St., Chicago
Rockford Iron Works, Rockford, Ill.

Presses, Screw

Atlas Press Co., Kalamazoo, Mich.
Lourie Mfg. Co., Springfield, Ill.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Towsley Mfg. Co., John T., Cincinnati
Weaver Mfg. Co., Springfield, Ill.

Pulley Machinery

Avey Drilling Machine Co., Cincinnati

Punch Press Feeds

Rockford Iron Works, Rockford, Ill.

Punch, Shear and Bender, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago

Punches, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Mch. Co., T. H., 417 E. 31st St., New York
Whitney Metal Tool Co., Rockford, Ill.

Classified Finding Index

Punches, Power

Clough, R. M., Meriden, Conn.
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Punches and Dies

Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H., 417 E. 31st St.,
Rockford Iron Works, Rockford, Ill. (N. Y.)

Racks, Bar Stock

New Britain Machine Co., New Britain, Conn.

Reamer Holder, Floating

Victor Tool Co., Inc., Waynesboro, Pa.

Reamers, Adjustable

Clough, R. M., Meriden, Conn.
McCroskey Tool Corporation, Meadville, Pa.

Reamers, Cylinder

Hinckley Machine Works, Hinckley, Ill.
McCroskey Tool Corporation, Meadville, Pa.

Reamers, Solid

Clough, R. M., Meriden, Conn.
Elico Tool Corporation, Rockford, Ill.
McCroskey Tool Corporation, Meadville, Pa.
Ready Tool Co., Bridgeport, Conn.

Reels, Extension

Cincinnati Specialty Mfg. Co., Cincinnati

Riveting Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.
High Speed Hammer Co., Rochester, N. Y.

Rod Cutters

Armstrong-Blum Mfg. Co., 341 N. Francisco
Av., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H., 417 E. 31st., N. Y.
Tucker, W. C. & F. C., Hartford, Conn.

Roller Bearings

Gwilliam Co., The, 23 Flatbush Ave., Brooklyn,
New York

Saws, Slitting

Elico Tool Corporation, Rockford, Ill.

Scraping Machines, Pneumatic

Anderson Brothers Mfg. Co., Rockford, Ill.

Screw Driving Machines, Automatic

Reynolds Machine Co., Massillon, Ohio

Screw Machines, Automatic

Brown & Sharpe Mfg. Co., Providence, R. I.
National Acme Company, Cleveland
New Britain Mch. Co., New Britain, Conn.

Screw Machines, Auxiliary

National Acme Company, Cleveland

Screws, Cap and Set

National Acme Company, Cleveland

Second-Hand Machinery Dealers

Bath & Co., Cyril J., Cleveland
Botwinik Brothers, New Haven, Conn.
Brown Machinery Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.

Second-Hand Mch. Dealers—Cont'd

Dale Machinery Co., Inc., 541 Washington
Bldg., Chicago
Enterprise Machinery Co., 32 S. Clinton St.,
Chicago
Empire Machinery Exchange, Cleveland
Kasley Machinery Co., E. L., 555 Washington
Bldg., Chicago
Federal Mch. Sales Co., 12 N. Jefferson St.,
Chicago
Graves Mch. Exch., 50 Church St., New York
Harris Bros. Co., W. 35th & Iron, Chicago
Hill, Clarke & Co., 625 Wash't'n Bldg., Chicago
Industrial Machinery & Sales Co., 549 W.
Washington Bldg., Chicago
Johnson & Sons Machinery, Co., Wm. C.,
St. Louis, Mo.
Jones Machine Tool Co., Cincinnati
Kemp Machinery Co., Baltimore, Md.
Little Co., W. F., Cleveland
Lucas & Son, Inc., J. L., Bridgeport, Conn.
Lynd-Farguhar Co., Boston, Mass.
McCabe Lathe & Machinery Corp., J. J.,
140 Broadway, New York
McDonald Machinery Co., St. Louis
McMullen Mch. Co., Grand Rapids, Mich.
Machineshop Equipment Corp'n, Boston
Machine Tool Engineering Co., Inc., 95
Liberty St., New York
Marshall & Husehart Machinery Co., 17 S.
Jefferson St., Chicago
Moth & Merryweather Mch. Co., Cleveland
Niles-Bement-Fond Co., 111 Broadway, N. Y.
Norton-Broadway Mch. Co., Cincinnati
O'Brien Machinery Co., Philadelphia
Osborne & Sexton Machy. Co., Columbus, O.
Parker & Co., D. C., Cleveland
Parker Co., Frank H., 1st National Bank
Bldg., Chicago
Peninsular Machinery Co., Detroit, Mich.
Russell Machine Co., Pittsburgh, Pa.
Simmons Machine Co., Albany, N. Y.
Stocker-Rumely-Wachs Co., 117 N. Jefferson
St., Chicago
Strong, Carlisle & Hammond Co., Cleveland
Syracuse Supply Co., Syracuse, N. Y.
Toumey, Inc., Frank, Philadelphia
Vonnegut Machinery Co., Indianapolis, Ind.
Wayne Machy. Co., Fort Wayne, Ind.
Winterer, Herman L., Philadelphia
White Machy. Co., A. D., 108 N. Jefferson
St., Chicago
Wright, David A., Jefferson & Monroe Sts.,
Chicago

Shafts, Flexible

Stow Flexible Shaft Co., Philadelphia

Shafts, Steel

American Hollow Boring Co., Erie, Pa.

Shaper Attachment

Moore Co., H. A., Rochester, N. Y.

Shaping Machines

Columbia Machine Tool Co., Hamilton, Ohio
Davis Machine Tool Co., Rochester, N. Y.
Milwaukee Shaper Co., Milwaukee, Wis.
Osborne & Sexton Machy. Co., Columbus, O.
Simmons Machine Co., Albany, N. Y.
Smith & Mills Co., Cincinnati
Streine Tool & Mfg. Co., New Bremen, Ohio

Shears, Hand

Armstrong-Blum Mfg. Co. 341 N. Francisco
Av., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
T. H. Lewthwaite Machine Co., 417 E. 31st
St., New York
Tucker, W. C. & F. C., Hartford, Conn.
Whitney Metal Tool Co., Rockford, Ill.

Classified Finding Index

Shears, Power

Hendley & Whittemore Co., Beloit, Wis.
Quickwork Co., St. Marys, Ohio

Sine Bars

Way Co., A. F., Hartford, Conn.

Slotting Attachment for Planer and Shaper

Moore Co., H. A., Rochester, N. Y.

Slotting Machines

Clough, R. M., Meriden, Conn.

Sprockets

Cullman Wheel Co., 1344 Altgeld St., Chicago

Steel, High Speed

Herbert, Ltd., Alfred, 50 Church St., New York

Steel, Tool

Herbert, Ltd., Alfred, 50 Church St., New York

Stock Supports

Way Co., A. F., Hartford, Conn.
Will-Burt Company, Orrville, Ohio

Straightening Machines

Towsley Mfg. Co., John T., Cincinnati
Whitney Metal Tool Co., Rockford, Ill.

Swaging Machines

Etna Mfg. Co., Toledo, Ohio

Tables, Circular

Hinckley Machine Works, Hinckley, Ill.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Tap Extractors

Walton Co., Hartford, Conn.

Tapping Machines and Attachments

Avey Drilling Machine Co., Cincinnati
Beaman & Smith Co., Providence, R. I.
Ricknell-Thomas Co., Greenfield, Mass.
Burke Machine Tool Co., Conneaut, Ohio
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Rickert-Shafer Co., Erie, Pa.
Turner Machine Co., Danbury, Conn.
Whitney Mfg. Co., Hartford, Conn.
Whitney Metal Tool Co., Rockford, Ill.

Taps, Collapsing

Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
Victor Tool Co., Inc., Waynesboro, Pa.

Taps and Dies

National Acme Company, Cleveland
Victor Tool Co., Inc., Waynesboro, Pa.

Thread Grinders

Bath & Co., Inc., John, Worcester, Mass.

Threading Machines, Bolt and Stud

National Acme Company, Cleveland

Threading Tools

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland
Ready Tool Co., Bridgeport, Conn.

Tool Holders

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Cleveland National Mche. Co., Cleveland
Ready Tool Co., Bridgeport, Conn.
Simmons Economy Tool Corp., Albany, N. Y.
Western Tool & Mfg. Co., Springfield, Ohio

Tools, Boring

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
B. & W. Tool & Die Co., Cleveland

Tools, Lathe and Planer

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ready Tool Co., Bridgeport, Conn.

Tools, Machinists'

Armstrong Bros. Tool Co., 308 N. Francisco
Brown & Sharpe Mfg. Co., Providence, R. I.

Trucks, Machine Shop

New Britain Machine Co., New Britain, Conn.
Towsley Mfg. Co., John T., Cincinnati

Turntables

Canton Foundry & Machine Co., Canton, O.

Valves

Powell Co., Wm., Cincinnati

Valve Seat Planing Machines, Portable

Underwood Corp., H. B., Philadelphia

Vises, Drilling Machine

Armstrong-Blum Mfg. Co., 341 N. Francisco
Av., Chicago
Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Carter & Hakes Mche. Co., W. Winsted, Conn.
Germanow-Simon Mch. Wks., Rochester, N. Y.
Thomas Elevator Co., 31 S. Hoyle Ave.,
Chicago

Vises, Machinists'

Hollands Tool Co., Erie, Pa.
New Britain Machine Co., New Britain, Conn.
Western Tool & Mfg. Co., Springfield, Ohio

Vises, Milling Machine

Carter & Hakes Mche. Co., W. Winsted, Conn.
Germanow-Simon Mch. Wks., Rochester, N. Y.
Hardinge Brothers, 1770 Berteau Av., Chicago
Hartford Special Mch. Co., Hartford, Conn.

Vises, Shaper

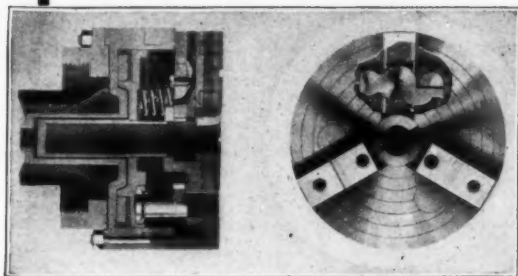
Columbia Machine Tool Co., Hamilton, Ohio

Wood Working Machinery

Hendley & Whittemore Co., Beloit, Wis.
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Pilot Bar Chuck

Made in 8"-10"-12"-15"-18" sizes of either Two or Three Jaw Manufacturing or Adjustable Types

The Frontier Pilot Bar Chuck is designed to meet the conditions where tools must be piloted. It is of the same simple construction as the other types of Frontier Chucks and is attached to the working end of the spindle. The Pilot Bushing is screwed into the face of the chuck which makes it absolutely rigid and concentric with the outside diameter at all times. The Pilot Tube will allow pilots of any desired length to be used. This chuck will bear your investigation. We also manufacture standard chucks without pilot bushings and drill press chucks.

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Frontier Chuck & Tool Co., Inc.

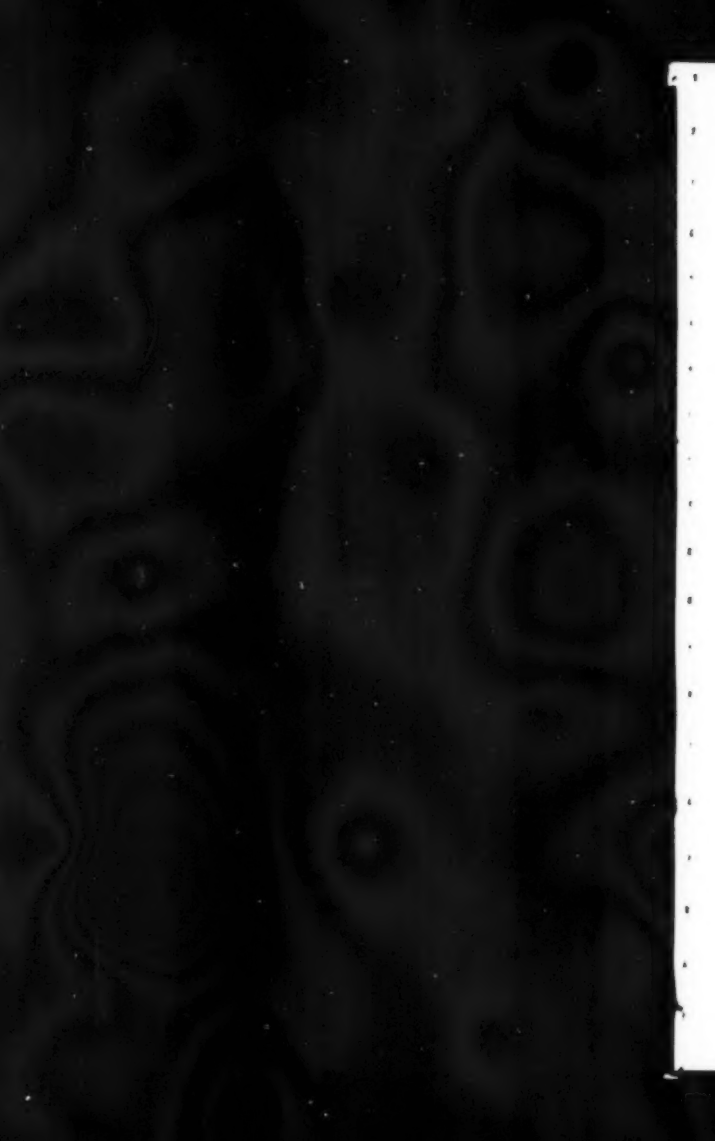
30 Letchworth Street,

BUFFALO, N. Y.

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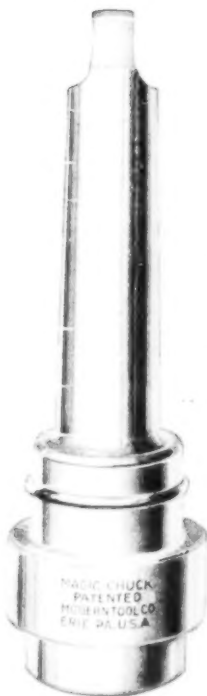




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4 vs 13



To cut costs eliminate wastes

One very important waste is that of tool changes when an old style chuck is used.

The "Magic" reduces the necessary movements in changing small tools from 13 to 4. The saving is obvious.

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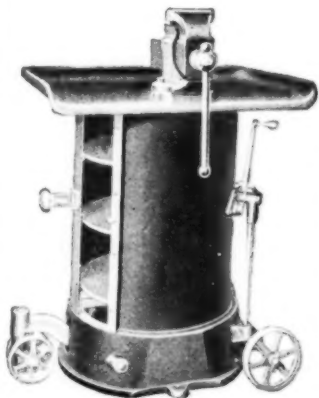
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**"Shop Furniture
Originators"**



**New Britain,
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